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Effect of end treatment on CCA preservative distribution in regrowth karri transmission poles

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SUMMARY

An increasing number of regrowth karri (*Eucalyptus diversicolor* F. Muell.) poles were being used in transmission lines throughout Western Australia. In 1989 the formation of tyloses in vessels in the sapwood band after the tree was felled apparently caused some problems with achieving satisfactory distribution of copper-chrome-arsenic (CCA) preservative in poles. One method suggested to restrict tyloses formation was to end-seal sapwood bands, immediately after felling the tree and docking it to pole length. Two proprietory log end sealers, 'Pabco' and 'Cellavit WR151', were applied to sapwood bands immediately after felling and docking to test the theory. The poles were treated either green or dry (sapwood below 30 per cent moisture content) using a long-wet vacuum method.

No significant difference in CCA retention was found between poles sealed with 'Pabco', 'Cellavit WR151' or untreated, or between poles treated green or below 30 per cent moisture content. Using the SECWA pole specification 8 out of 23 specimens achieved the minimum retention requirement of 1.6 per cent mass/mass for individual poles. Australian Standard AS1604-1993 specifies a lower retention minimum of 1.2 per cent mass/mass for Hazard level 5, and in this trial one specimen failed the specified minimum retention requirements while two retentions (1.17 and 1.19 per cent) were borderline.

INTRODUCTION

The State Energy Commission of Western Australia (SECWA) require several thousand power poles each year for replacement in existing transmission lines, and for providing additional services. The Department of Conservation and Land Management, as manager of State Forest, is the principal supplier of these poles. The major species used are jarrah (*Eucalyptus marginata* Donn ex Sm.) and WA blackbutt (*E. patens* Benth.). However, in 1989 an increasing proportion of the supply was from regrowth karri (*E. diversicolor* F. Muell.), and in 1988/89 the Department supplied about 1200 karri poles.

In early 1989 a local timber preservation plant reported to the Department about occasional problems with achieving satisfactory distribution and retention of copper-chrome-arsenic (CCA) preservative into regrowth karri poles. Inspection of the sapwood band indicated apparently poor retentions in the treated cross-sections. The problem was thought to be the result of formation of tyloses in the vessels, which prevented penetration of the CCA in the preservation process. Tyloses are balloon-like structures inside the vessels, which occur when a living ray parenchyma (ray cell) borders an air-filled vessel (Wilkinson 1979). These growths are common to species with large diameter pits, such as eucalypts.

Although tyloses do not normally form in sapwood vessels, only in the heartwood, they can result from injury to the cambium. Other factors which may promote tyloses formation in sapwood include the following :

- air entering regions of water-conducting sapwood from dead branches;
- stresses resulting from rapid loss of moisture from regions of the sapwood actively involved in conduction of water and containing living ray cells with starch reserves;
- entry of micro-organisms through the root system or dead branches may cause increased activity of living cells to form enzymes which activate tyloses formation (Ilic 1989).

One or a combination of these factors would explain the formation of tyloses and consequent apparently poor penetration and retention of CCA in the sapwood of karri poles.

This paper describes the trial initiated to assess the theory that docking the poles to length immediately after the tree was felled, and then end-sealing the sapwood band with 'Pabco' or 'Cellavit WR151', would result in reduced formation of tyloses which would be reflected by improved penetration and retention of CCA in the power pole. After treatment using a long-wet vacuum method, penetrations and retentions of CCA preservative into green and dry (sapwood below 30 per cent moisture content) karri poles were compared.

METHODS

Thirty poles were harvested in January 1990 from 35-year-old regrowth karri growing in Mattaband Block, Walpole District. The trees were felled and docked overlength and extracted to a bush landing. At the landing each end was re-docked to actual length (11.0 m) and ten randomly selected poles end-coated with 'Pabco' or 'Cellavit WR151' within 10 to 15 minutes of felling or cutting, or left untreated . The poles in each treatment were colour coded at the time of coating for later identification, as follows :

Poles 1 - 10 -	'Pabco' (red)
Poles 11 - 20 -	'Cellavit WR151' (green)
Poles 21 - 30 -	Control - no end treatment (yellow).

All thirty poles were transported to Koppers Australia Pty Ltd, Picton for assessment and treatment. Five poles from each treatment were pressure treated with CCA while green, immediately upon arrival at Koppers, using the long-wet vacuum method (Richardson 1993). The CCA formulation ('Tanalith 0') used was :

34.5 per cent arsenic pentoxide,
18.5 per cent cupric oxide, and
47.5 per cent chromium trioxide (solution strength 7.42 per cent).

The remaining five poles were held until the sapwood moisture content was below 30 per cent, then treated using the long-wet vacuum method under the same conditions.

After treatment two samples (the third and fifth pole) from each treatment (total of twelve poles) had 1.5 m docked from the butt section, to a standard pole length of 9.5 m. The cross section of each pole was assessed visually for treatment penetration to observe any variation in treatability using sealants. The 1.5 m sections were then split longitudinally on a horizontal bandsaw to remove a sap-to-sap board 30 mm thick, cut through the centre. These boards were then assessed for variations in treatment with CCA in the sapwood zone of each board. There was no evidence of smearing effects.

After assessment each board was cut to three full length 30 x 30 mm sections, two from the sapwood zone (taper sawn from each side) and one from the outer heartwood zone. The sapwood sections included one from an apparently well treated zone, and one from an apparently poorly treated zone. These zones were identified by visual assessment of colour variations, which suggested marked differences in preservative retentions. From the sawn sections, three 30 mm squares by 150 mm long specimens were cut to provide one for laboratory assessment by the Queensland Forest Service, one for Koppers and one to bait a termite test mound at the Wood Utilisation Research Centre (WURC), Harvey. Heartwood specimens were not sent for analysis because no CCA had penetrated. Each specimen was numbered and marked according to end coating and CCA treatment schedule for later identification as follows :

Pole No. :	(3 or 5)
End treatment colour code :	R - ('Pabco')
	G - ('Cellavit')
	Y - (Control)
CCA treatment schedule :	Green
	30 per cent MC
Treatment zone :	T - Well treated
	PT - Poorly treated
	H - Heartwood.

For example, 3 Y Green PT indicated pole No. 3, control, green at the time of treatment, and PT for poorly treated sapwood from visual assessment.

Chemical analysis of apparently well treated and apparently poorly treated specimens was carried out by the Chemistry and Wood Preservation Laboratory of the then Queensland Forest Service. Using methods outlined in AS 1605-1974 (Standards Association of Australia 1974), retention of individual elements (arsenic, chromium and copper), the total CCA elements (percentage mass/mass as the sum of individual retentions), and CCA oxide were determined. CCA oxide retention for each specimen was calculated from the following formula :

$$\text{Oxide retention (kg m}^{-3}\text{)} = (\text{Total CCA elements}) \times 1.62 \times \frac{\text{air-dried density}}{100}$$

Kingston and Risdon (1961) quoted a mean air-dried density (12 per cent moisture content) for karri as 905 kg m^3 and this was used to convert retentions from percentage mass/mass to mass/volume (kg m^{-3}).

Analysis of variance was used to test the effect of end sealants, difference between observed depth of penetration and the effect of treating green or at moisture contents below 30 per cent.

RESULTS AND DISCUSSION

Observations of regrowth karri power transmission poles treated with CCA using the long-wet vacuum method on green poles indicated variations in retention values. As stated previously, the purpose of this trial was to determine whether any improvement is possible in green pole treatment by using end coat sealants immediately after felling, while sapwood moisture content is at a maximum.

Chemical analysis

Total CCA elements and CCA oxide retentions for each end treatment and preservative treatment method are listed in Table 1. Mean basic density of the regrowth karri poles

TABLE 1

Total CCA elements and CCA oxide retentions for regrowth karri poles using different sealers and treated at different moisture contents

POLE NO.	APPARENT TREATMENT	MOISTURE CONTENT(%) AT TREATMENT	END SEALER	TOTAL CCA ELEMENTS (% mass/mass)	OXIDE RETENTIONS (kg m^{-3})
1	Full	Below 30	Cellavit	1.17	17.2
	Partial	"	"	1.31	19.2
2	Full	"	"	1.55	22.7
	Partial	"	"	1.88	27.6
3	Full	"	Pabco	1.19	17.4
	Partial	"	"	0.94	13.8
4	Full	"	"	1.50	22.0
	Partial	"	"	1.90	27.9
5	Full	"	Control	1.20	17.6
	Partial	"	(unsealed)	1.68	24.6
6	Full	"	"	1.38	20.2
	Partial	"	"	1.34	19.6
7	Full	Green	Cellavit	1.57	23.0
	Partial	"	"	Insufficient sapwood	for analysis
8	Full	"	"	1.84	27.0
	Partial	"	"	2.35	34.5
9	Full	"	Pabco	1.54	22.6
	Partial	"	"	1.45	21.3
10	Full	"	"	1.63	23.9
	Partial	"	"	1.52	22.3
11	Full	"	Control	1.53	22.4
	Partial	"	(unsealed)	1.23	18.0
12	Full	"	"	2.05	30.1
	Partial	"	"	1.77	25.9

was 651.3 kg m^{-3} (standard deviation 34.9 kg m^{-3}) with range 578 to 719 kg m^{-3}. The Australian Standard AS 2209-1979 on timber poles for overhead lines (Standards Association of Australia 1979) gives minimum charge retentions of preservative as salt formulation, for example Tanalith 'C' or 'CA' has a minimum charge retention for hardwoods of 25 kg m^{-3}, which is equivalent to 14.7 kg m^{-3} oxide. Within that charge the retention of any pole shall be not less than two-thirds of that retention (i.e. 9.8 kg m^{-3} oxide). A preliminary redraft of AS 2209-1979, written in June 1992, specified the required salt and oxide retentions (Local Government Electricity Association of New South Wales 1992). For hardwoods the retention in an individual pole, in the penetration zone, shall not be less than 1.1 per cent mass/mass or 30 kg m^{-3} (salt) and 1.1 per cent mass/mass or 18 kg m^{-3} (oxide). The mass/volume figure is derived from those for retention on a percentage mass/mass basis using the calculation referred to. For this redraft the density of hardwoods was assumed to be that of spotted gum (*E. maculata* Hook.) at 12 per cent moisture content.

The SECWA specification is based on AS 2209-1979, however, retentions are given as oxides and consequently lower than the equivalent salt values. The conversion factor used is 1.7. SECWA specify the average retention of the inner half of the sapwood of all poles in any one charge shall not be less than 2.3 per cent (mass of preservative, expressed as oxides)/(mass of dry wood), which is 33.7 kg m^{-3}. The minimum retention in any pole shall be 1.6 per cent mass/mass (23.5 kg m^{-3} oxide) in the inner half of the sapwood, and the full depth of sapwood needs to be penetrated. The SECWA specification reflects industry standards on the East Coast of Australia, and is very similar to the requirements of the South East Queensland Electricity Board for both penetration and retention (Duff[1] personal communication). The retention referred to above is 1.5 times the minimum retention required in the redrafted AS 2209-1979 and 1.3 times the minimum retention required for hazard level 5 in the revised Australian Standard AS 1604-1993. In the present report percentage mass/mass and oxide retentions are used.

It must be stressed that any sample taken from a treated pole gives an indication only of penetration and retention of the preservative, because there is a gradient from the outside to the inside of the treated sapwood zone, and longitudinal variations also occur at a specific distance from the outside.

[1] Mr B. Duff, Koppers Australia Pty Ltd, Picton, WA.

Using the SECWA pole specification, only 8 out of 23 specimens had retentions greater than 1.6 per cent mass/mass, with 60 per cent treated green, while 15 had retentions greater than 1.4 per cent mass/mass. Using the redraft of AS 2209-1992, only one pole failed the minimum retention of 1.1 per cent mass/mass with a retention of 0.94 per cent mass/mass, slightly lower than the required minimum, and would require re-testing. Four poles would fail hazard level 5 in draft AS-1604 which requires a minimum retention of 1.2 per cent mass/mass.

Table 2 compares the mean retentions of preservatives in poles with and without end sealants. No significant difference was found between poles sealed with 'Pabco', 'Cellavit WR151', or left untreated ($p = 0.250$ NS).

Table 3 lists the means and standard deviations for total element and oxide retentions for specimens from the full and poorly penetrated zones. These results indicated that the apparent differences in colour, and the occurrence of tyloses, were a perception that did not affect the retention of preservative and therefore the performance of the timber in-service. Inspection of transverse sections from different treatments had not indicated any differences in the occurrence of tyloses in the sapwood. Quantitative data were not collected because the occurrence of tyloses in individual vessels is not related to preservative penetration. One or a few tyloses may be sufficient to block penetration, although there could be many in a vessel. It cannot be categorically stated that end-sealing did reduce the incidence of tyloses.

The mean retentions of samples taken from the apparently well treated zones were actually less than those of apparently poorly treated zones with a non-significant difference of 0.07 per cent mass/mass ($p = 0.365$ NS). Comparing the well and poorly treated zones on individual poles, specimens from 5 out of 11 poles (45 per cent) had higher mean retentions in the apparently poorly treated zones, which meant that the colour variations in these zones did not necessarily indicate low retentions. As stated previously, the demarcation was based on visual assessment.

No significant difference in mean retention was found between treating poles green or below 30 per cent moisture content ($p = 0.142$ NS) (Table 4). However, poles treated green had a slightly higher mean retention (mean difference 0.26 per cent mass/mass) and of the nine that passed the SECWA specification 66 per cent were treated green.

The treatment method had no effect (Table 4). No significant difference was found between specimens from the well or poorly penetrated zones, treated either green ($p = 0.339$ NS) or at moisture contents below 30 per cent ($p = 0.881$ NS), indicating an even penetration of CCA preservative through the full sapwood depth. Tyloses may have formed in the sapwood as poles dried to a moisture content below 30 per cent or they had already formed in the living tree, which restricted the penetration of CCA preservative. Entry of micro-organisms through the root system or through dead branches, may cause increased activity of living cells to form enzymes which activate tyloses formation (Ilic 1989). This sample of poles and the majority of poles being commercially treated at that time had a number of external bumps along the bole which would have resulted from branch occlusion and associated insect or fungal damage, and possibly resulted in tyloses

TABLE 2

Effect of end treatment on total CCA elements and oxide retention in regrowth karri poles

END SEALER	'PABCO'			'CELLAVIT WR151'			UNTREATED CONTROL		
	MEAN	SD	RANGE	MEAN	SD	RANGE	MEAN	SD	MEAN
Total CCA elements (% mass/mass)	1.46	0.29	0.94 - 1.90	1.67	0.40	1.17 - 2.35	1.52	0.30	1.20 - 2.05
CCA oxide retentions (kg m^{-3})	21.14	4.25	13.78 - 27.86	24.48	5.86	17.15 - 34.45	22.28	4.40	17.59 - 30.06

TABLE 3

Total CCA elements and oxide retentions for regrowth karri sapwood.

	WELL TREATED ZONE		APPARENTLY POORLY TREATED ZONE	
	MEAN	SD	MEAN	SD
Total CCA elements (% mass/mass)	1.51	0.26	1.58	0.39
CCA oxide retentions (kg m^{-3})	22.14	3.81	23.16	5.72

TABLE 4

Total CCA elements and oxide retentions for regrowth karri poles treated green or at 30 per cent moisture content

	GREEN		30 PER CENT MC	
	MEAN	SD	MEAN	SD
Total CCA elements (% mass/mass)	1.68	0.31	1.42	0.29
CCA oxide retentions (kg m^{-3})	24.63	4.54	20.82	4.25

formation in the sapwood. Since this trial the karri poles being treated by Koppers generally have a smooth bole with few external bumps, and treatment using a long-wet vacuum process has resulted in good penetration and retentions of CCA (Duff personal communication).

GENERAL

In summary, the trial indicated that the apparently poor retention in sapwood affected by tyloses was a perception only. There were no significant differences in retention between different end-treatments which should restrict formation of tyloses, or between specimens from poles treated green or 30 per cent moisture content. The SECWA retention requirements are higher than those of Australian Standards, a matter which needs to be resolved.

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Wood density and spiral grain of radiata pine and maritime pine grown in Donnybrook Sunkland trial plots

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SUMMARY

A survey of wood density of radiata pine (*Pinus radiata* D. Don) and maritime pine (*P. pinaster* Ait.) grown in trial plots in the Donnybrook Sunkland area, south-east of Busselton, assessed the effects of site type, area within site, and height in tree. Ages varied from 11- to 24-years-old.

The overall mean basic densities for radiata pine and maritime pine were 395 kg m^{-3} and 425 kg m^{-3}, and the mean air-dry densities 520 kg m^{-3} and 570 kg m^{-3} respectively. The expected trends of decreasing density with increasing height in the tree were confirmed. Analysis of the data showed significant differences ($p<0.001$) between species and between different heights in tree with both basic density and air-dry density, but in the former parameter, area and species x site and species x area interactions were also significant at the same level.

Spiral grain showed a decreasing trend from the pith to ten growth rings, but there were no significant differences between species, site, area, or height in tree.

INTRODUCTION

Assessment of wood properties is essential for efficient utilization of the forest resource. Wood density (particularly basic density and air-dry density) is closely related to properties such as bending strength, stiffness, and compression strength, and is the best single indicator of wood quality. Spiral grain has a negative correlation with strength properties (Bamber and Burley 1983).

In the early 1980s the Donnybrook Sunkland plantations south-east of Busselton were planned to include 60 000 ha, and provide a major part of the resource required by the softwood timber milling industry. A change in Government policy in 1983 resulted in a ban on clearing of native forest for plantation establishment, and consequently the current total area planted is about 11 500 ha.

A series of trial plots had been established in the Sunkland, with radiata pine and maritime pine the major species planted. The present trial was initiated prior to the policy change, and was designed to assess variations in wood density resulting from the following factors:

(1) species differences;
(2) site type differences;
(3) area within site type effects;
(4) height in tree.

The spiral grain survey was intended to give some indication of the variations in this parameter in the juvenile core, i.e. up to ten growth rings from the pith.

METHODS

The plots sampled were Molloy plots 9, 11, and 14; Willcock plots 17 and 18; and Ridge Road plot 2. They were randomly selected to represent the three major site types (McCutcheon 1978) used for pine plantations, with two areas of each site type. The silvicultural history of these plots is given in the Appendix.

The individual treatments in the study were:

Species:	radiata pine and maritime pine.
Site types:	Sunkland site types 3, 4 and 5.
Area within site type:	two randomly selected plots relevant to the above. (Originally three were intended, but the changed policy justified reverting to two.)
Heights in tree:	ground line, breast height (1.3 m), 3 m, 6 m, 9 m.
No. of trees:	three randomly selected trees per plot.

Harvesting commenced in 1982-83. The trees were felled, after diameter at breast height over bark (d.b.h.o.b.) was recorded. Tree height was measured on ground. Discs of 40 mm thickness were cut perpendicular to the stem axis at five heights, and immediately marked for later identification and placed in a plastic bag. Two bark-to-bark strips were then cut along the minor axis of the disk, one each side of the pith, to provide matched specimens. One specimen was used for assessment of basic density and one for air-dry density. The minor axis was used instead of the major axis to reduce the possibility of reaction wood affecting the results.

Basic density was calculated from the oven-dried mass (after drying at 103°C until constant weight was achieved) and from green volume (after estimating volume using the displacement method in a graduated cylinder. Accuracy was to 0.5 cm^3). Air-dry density was calculated from air-dry mass and air-dry volume, i.e. at equilibrium moisture content of about 12 per cent. The air-dry volume was also estimated using the displacement method, after reweighing a few specimens after immersion indicated that absorption effects were negligible. The density estimates are an underestimate of the actual cross-sectional density because the use of diametric strips gives less weight to the higher density mature wood.

Spiral grain of every second growth ring was estimated after hitting the transverse section of the specimen with a 5-mm-wide sharp chisel, and splitting off a piece which followed the grain orientation. An engineer's square was then used to estimate the spiral grain angle at each second growth ring from the pith up to the tenth ring. The estimated accuracy was 0.5°.

The data were analysed using analysis of variance, to assess the comparative effects of site type, area, and height in tree on wood density in each species. The main interest with the spiral grain data was the variation in the juvenile core (i.e. up to 10 rings from the pith) and the data were consequently assessed differently from those for wood density.

RESULTS AND DISCUSSION

The mean values and standard deviations of total height and d.b.h.o.b. of each of the trees sampled in the wood density and spiral grain survey are given by species and site type in Table 1.

Mean overall basic densities of the radiata pine and maritime pine samples were 395 kg m^{-3} (SD 42 kg m^{-3}) and 425 kg m^{-3} (SD 60 kg m^{-3}) respectively. The comparative air-dried densities were 520 kg m^{-3} (SD 65 kg m^{-3}) and 570 kg m^{-3} (SD 85 kg m^{-3}).

Kingston and Risdon (1961) gave air-dry density values of 593 kg m^{-3} for radiata pine and 596 kg m^{-3} for maritime pine, while Shedley and Challis (1984) quoted air-dry density values of 530 kg m^{-3} for radiata pine and 577 kg m^{-3} for maritime pine. In comparison Siemon (1983) reported a mean air-dry density for maritime pine of 558 kg m^{-3} in a large-scale assessment of strength properties of different provenances.

The lowest mean value for air-dry density was at 9 m height, with 460 kg m^{-3} for radiata pine trees on site types 3 and 4, and 490 kg m^{-3} for maritime pine on site type 5. There would not be problems with utilization at this comparatively large mean density, because the grading rules specify a minimum density of 300 kg m^{-3} (Standards Association of Australia 1986).

The variation in basic density with increasing height in the tree is shown in Figure 1, using the average density value of the six trees at the five heights in each site type. The trends of decreasing mean values with increasing height in the tree are consistent in both species and over the three site types. The air-dry density showed similar trends.

TABLE 1

Mean height and d.b.h.o.b. of sample trees assessed in the wood density and spiral grain survey of radiata pine and maritime pine growing in Donnybrook Sunkland trial plots (N = six trees per site type).

		RADIATA PINE		MARITIME PINE	
Site	Type	Ht(m)	d.b.h.o.b. (cm)	Ht (m)	d.b.h.o.b. (cm)
3	Mean	15.5	16.6	12.6	17.9
	SD	2.1	1.6	0.7	1.9
4	Mean	16.2	17.0	13.8	20.1
	SD	2.3	1.6	3.9	3.8
5	Mean	16.3	16.7	12.9	19.8
	SD	2.0	2.5	1.2	2.8

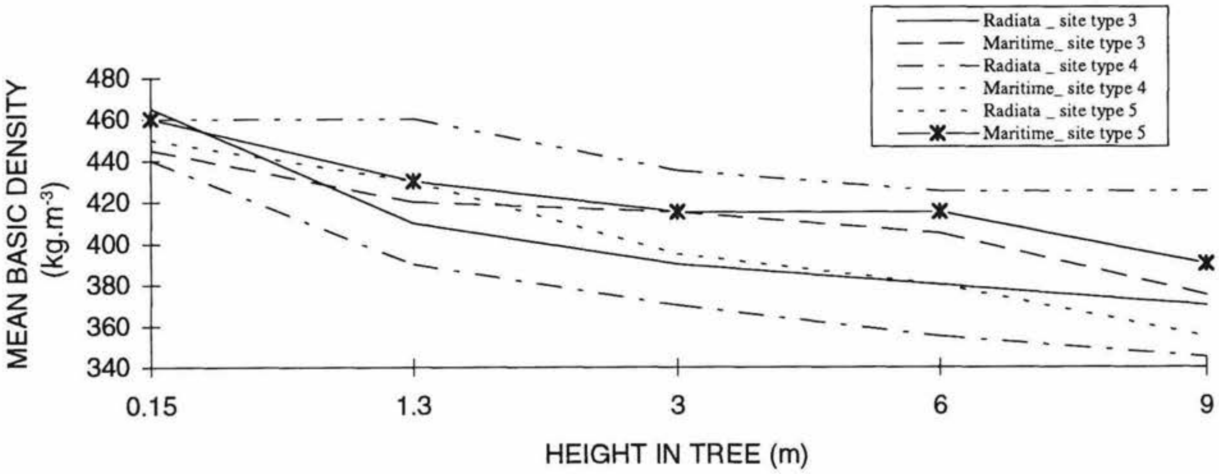

Figure 1. Effect of site type and height in tree on mean basic density of radiata pine and maritime pine grown in Donnybrook Sunkland trial plots.

The analyses showing the effects of species, site type, area and height in tree on basic density and air-dried density are presented in Tables 2 and 3 respectively.

For basic density, species, species x site type, area, species x area and height in tree, were all significantly different at $p<0.001$. Site type x area was significantly different at $p<0.01$. Site type was not significant.

When air-dry density was assessed, the factors of species and height in tree were significant at the same level ($p<0.001$), and species x area at $p<0.05$, but the other factors were not significant (Table 3). As for basic density, site type was not significant. The variation between areas is more difficult to explain, and possibly is an effect of genetics rather than environment, with a comparatively small sample.

The main significant differences found were between species and height in tree ($p< 0.001$), and between species x site ($p<0.01$). Significance of the species x area interaction ($p< 0.05$) would be attributed to the effect of species. Site type and area and the other interactions were not significantly different.

The magnitude of spiral grain with increasing number of rings from the pith (Table 4) shows an overall decreasing trend. The high standard deviations could be owing to genetic variation, sampling effects, accuracy of measuring angles, environmental variations or a combination of these factors. The data give an indication of the changes in spiral grain with increasing distance from the pith in the first ten growth rings.

Analysis of variance indicated that with spiral grain there were no significant differences between species, site, area, or height in tree, or between any interactions.

Continuous improvements are resulting from changes in silvicultural practices and a very efficient tree breeding program. A research project on the effects of thinning and fertilizing on wood density in radiata pine, is currently being carried out by Mr I. Dumbrell of CALM's Busselton Research Centre.

Overall, the results of the present trial indicated that the density of trees in the Sunkland trial plots would not be a constraint in providing an acceptable product for structural grade timber. The relevant Australian Standard for visually stress-grading softwood timber (Standards Association of Australia 1986) requires a minimum average density (at 12 per cent moisture content) for the species of 360 kg m^{-3}, with no individual pieces below 300 kg m^{-3}. The data from this trial indicated substantially higher density with overall mean air-dry densities of 520 kg m^{-3} for radiata pine and 570 kg m^{-3} for maritime pine. As stated previously, the lowest mean value was 460 kg m^{-3} for radiata pine at 9 m height. The sloping grain estimates in this trial indicated that this parameter should not cause particular problems when grading pine timber to AS2858-1986 (Standards Association of Australia 1986). The allowable sloping grain for F5 stress grade, the major grade separated, is 1 in 5 which is equivalent to 11.3°. It is well documented (e.g. Bamber and Burley 1983) that sloping grain is at a maximum in juvenile wood, and decreases in mature wood.

TABLE 2

Variation in basic density of radiata pine and maritime pine grown in the Donnybrook Sunkland trial plots.

TREATMENT	DF	F VALUE	SIGNIFICANCE[a]
Species	1	44.2	***
Site type	2	0.4	NS
Species x site	2	11.7	***
Area	1	59.4	***
Species x area	1	70.3	***
Site type x area	2	5.9	**
Species x site x area	2	2.1	NS
Height in tree	4	27.3	***
Species x height	4	1.7	NS
Site x height	8	0.4	NS
Species x site x heights	8	0.3	NS
Height x area	4	1.1	NS
Species x height x area	4	1.2	NS
Site x height x area	8	1.0	NS
Species x site x height x area	8	0.1	NS
Error	120		
	179		

*** Significant at $p < 0.00$
** Significant at $p < 0.01$
* Significant at $p < 0.05$
NS Not significant

TABLE 3

Variations in air-dry density of radiata pine and maritime pine grown in Donnybrook Sunkland trial plots.

TREATMENT	DF	F VALUE	SIGNIFICANCE[a]
Species	1	25.3	***
Site type	2	1.0	NS
Species x site	2	4.9	**
Area	1	2.4	NS
Species x area	1	4.0	*
Site type x area	2	2.1	NS
Species x site x area	2	0.4	NS
Height in tree	4	28.0	***
Species x height	4	0.0	NS
Site x height	8	0.2	NS
Species x site x heights	8	0.5	NS
Height x area	4	0.6	NS
Species x height x area	4	2.3	NS
Site x height x area	8	1.0	NS
Species x site x height x area	8	1.0	NS
Error	120		
	179		

*** Significant at $p < 0.001$
** Significant at $p < 0.01$
* Significant at $p < 0.05$
NS Not significant

TABLE 4

Variation in spiral grain (degrees) from stem axis in juvenile wood of radiata pine and maritime pine.

		NUMBER OF RINGS FROM PITH				
		2	4	6	8	10
Radiata pine	Mean	8.4	7.3	6.3	5.8	7.5
	S.D.	2.0	2.2	3.0	2.3	4.5
Maritime pine	Mean	8.1	8.8	7.4	7.0	6.1
	S.D.	2.5	3.0	2.6	3.8	3.9

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APPENDIX

Silvicultural history of the Donnybrook Sunkland trial plots sampled for the pine wood density and spiral grain survey.

Molloy 9 : *Pinus radiata* and *P. pinaster*.
Planted 1970. (2.44 m x 1.82 m spacing (2000 stems ha^{-1})).

1978	Culled to 750 stems ha^{-1} low pruned to 2 m.
1974	(*P. radiata*) 2.5% Zn SO_4 + Mn SO_4 foliar spray.
1974	(*P. pinaster*) 5.0% Zn SO_4 + Mn SO_4 + 0.2% Cu SO_4 foliar spray.
1974	200 kg ha^{-1} Super Broadcast.
1977	400 kg ha^{-1} Agras No. 1.
1980	400 kg ha^{-1} Super Copper Zinc B Mix.

Molloy 11 : *P. radiata*.
Planted 1971 (2.74 m x 1.82 m spacing).

1971	Whole area (4.0 ha) set up as initial fertilizer trials.
1977	Northern 2.0 ha set up at rates of Agras 18:18 refertilization trial. This trial was terminated in 1982.
1977	Southern 2.0 ha was thinned to 500 stems ha^{-1} and received 400 kg ha^{-1} Agras 18:18.

Other details - 1974 - 5% Zn SO_4 + Mn SO + 0.2% Cu SO_4.

1974	2.5% Zn SO_4 + Mn SO_4.
1975	200 kg ha^{-1} Super.
1982	250 kg ha^{-1} Agras No. 1 + Super Copper Zinc B and 250 kg ha^{-1}.
1985	400 kg ha^{-1} Agras + Super Copper Zinc B 3:1 mix.

Molloy 14 : *P. radiata*.
Planted 1972 (2.74 x 1.82 m spacing).

1974	Research trial set up in northern 4.0 ha of *P. radiata* - various fertilizer treatments.
1974	200 kg ha^{-1} Super + 2.5% Zn + Mn SO_4 + 0.2% Cu SO_4 foliar spray.
1980	Super Copper Zinc B mix at 400 kg ha^{-1}.
1979	Low pruned to 2 m.
1980	High pruned to 5 m at 20 stems ha^{-1} (except Research area).

Willcock 17 : *P. radiata* planted 1967, *P. pinaster* planted 1969.
(2.74 x 1.82 m spacing)

P. radiata area :

1967	57 g/tree at planting.
1970*	10 kg Super broadcast.
1975*	227 g/tree of Super + 227 g/tree Urea.
1980*	400 kg ha^{-1} Super Copper Zinc.
1982	As per 1980 + 400 kg ha^{-1} Agras.
1975*	Low pruned to 2 m and culled to 741 stems ha^{-1}.
1980*	High pruned to 5 m.
1985	Thinned to 250 stems ha^{-1}.

* Applied to *P. pinaster* also.

Willcock 18 :	*P. radiata* and *P. pinaster*. Planted 1971 (2.74 x 1.82 spacing).
	P. radiata area :
1973	74 g/tree Zn SO_4 + Mn SO_4 2.5% foliar spray.
1974	5% Zn SO_4 + Mn SO_4 + 0.2% Cu SO_4 foliar spray.
1974	200 kg ha^{-1} Super.
1974, 77	400 kg ha^{-1} Agras 18:18.
1982	400 g/tree Agras + 400 g/tree Super Copper Zinc No. 2.
	P. pinaster area :
1986	250 kg ha^{-1} Agras + Minerals.
Both Species :	Low pruned to 2 m and culled to 750 stems ha^{-1} (unknown, but probably 1976/77)
1982/83	High pruned to 5 m.
1985	Thinned to 250 stems ha^{-1}.
Ridge Road Plot 2 :	*P. pinaster* planted 1958
1962	180 kg ha^{-1} Super. Also scrub control.

No other details were found in the records.

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The occurrence of mammal species on the islands of Australia: a summary of existing knowledge

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SUMMARY

We present databases summarizing the most recent available information on the occurrence of species of mammals on Australian islands. These databases include 512 islands, 171 species of mammal, and 1768 authenticated insular records. Relevant physical, climatic and anthropological data for each island and the source of each record (320 references) are also provided.

Introduction

This project began in 1987. In 1979 one of us commenced a card index of mammal records from Australian islands, based on published literature and *ad hoc* unpublished literature. The other had kept an inventory of mammals present on islands of Western Australia, based on published literature and on-going biological surveys. We subsequently combined these two sources into a microcomputer database, using dBASE III Plus (Ashton-Tate, USA).

Since 1989 lists for each State/Territory have been circulated to authorities for comment and correction. This process yielded further records which were incorporated into the databases. Then, as time permitted, we added relevant information about the physical, climatic and anthropological attributes of each island, and of the feeding niche and body mass of each mammal species.

The aim of this paper is twofold. Firstly, we would like to make this information more widely available, so that other researchers will know where the gaps in knowledge are. Hopefully, this will eventually increase the comprehensiveness of knowledge and we seek input from those with additions or corrections to the databases. Our second aim is that this paper serves as the basis of our analysis of the ecological and conservation significance of mammal distribution on Australian islands (Burbidge *et al.* in prep.). The information contained in the databases is correct up to 30 April 1992.

METHODS

Mammal species

Each mammal record (Database 1) is authenticated by a reference (Database 4), either from the literature or from unpublished sources. Several records of rock-wallabies from Northern Territory islands in Abbott (1980) are based on incorrect information (K.A. Johnson, *in litt.*); these have been deleted. The feeding niche and mean adult body weight have been taken from the most recent standard sources (Strahan 1983; Guiler 1985; Burbidge and McKenzie 1989). Nomenclature follows Walton (1988) and more recent taxonomic papers.

Islands

The current official name is used (Databases 1 and 2); however, where other names have been used in the literature these are included in parentheses. Duplicated names, such as North Island, are qualified by the addition of the group to which the island belongs or some other relevant attribute. In order to facilitate the locatability of islands, their geographical position has usually been indicated by the Ocean, Bay, Group or Archipelago in which the island occurs. The controlling political authority (Commonwealth, State or Territory) is also indicated. Islands under Indonesian or Papua New Guinean sovereignty are excluded from consideration.

Island area, maximum elevation and isolation (distance from the nearest larger landmass, whether the mainland or another island) were determined from 1 : 100 000 scale maps published by the Department of National Resources, Division of National Mapping. In several instances where sheets were not available in local libraries, other scale maps were consulted. Area was determined by planimeter or by dot-counting. Maximum elevations were sometimes interpolated from contours shown, and a few were taken from the Australia Pilot (1969-1973). Some islands joined by sandspits or drying mudflats/rocks have been treated as a single unit (e.g. Erith-Dover).

Bathymetric data were taken from the best published information available. For parts of the Australian coastline, the 1 : 250 000 scale maps published by the Department of National Resources, Division of National Mapping, provide the most recent information for depths exceeding 20 m. Certain portions of the coastline close to major shipping routes have been sounded to minimum depths of 2 m. Where available, such information has been taken from the hydrographic charts published by the Royal Australian Navy and the British Admiralty. For example, a depth of 35 m signifies that the landmass specified became an island when a sea level of 35 m below present sea level was reached. A depth of <20 (<3) in Database 2 indicates that, based on information on a small-scale chart, the island was isolated at some depth up to 20 m below present sea level. However, a large-scale map indicates that the island became isolated at a depth of 3 m below present sea level.

Obviously a landmass made an island by a depth of 35 m has been isolated for longer than one made an island by a depth of 3 m below present sea level.

Whether the island is currently joined naturally to the mainland is indicated in Database 2 by y (yes) or n (no). The former may signify that natural features such as sandspits or drying mudflats, are involved. The occurrence of an artificial bridge or causeway is signified by y (yes) in a separate column.

The median annual rainfall zone (to the nearest 100 mm or nearest 200 mm if greater than 800 mm) has been assigned on the basis of a map entitled 'Annual rainfall (median) mm 50 percentile' published by the Bureau of Meteorology (1988) at a scale of 1 : 12 500 000 and based on all years of record to 1973 inclusive.

Whether an island was accessible to Aborigines, before European settlement, is indicated by y (yes) or n (no), based on a map in Abbott (1980). The relevant anthropological literature is fully referenced in that publication.

Our judgement of how complete is the knowledge of the mammal fauna of each island has been indicated by y (yes) or n (no). In the case of seals, only islands used for breeding are listed. Some 159 islands were judged not to have been properly surveyed.

THE DATABASES

Database 1A is a catalogue of mammal species in systematic order (after Walton 1988) showing their occurrence on each island. Database 1B is the same information listed in alphabetical order of island name.

Database 2 lists all islands for which a mammal record was found. It provides information on jurisdiction, area, distance, bathymetry, connection to mainland, maximum elevation, median annual rainfall zone, accessibility of island to historical Aboriginal visitation, and completeness with which the mammal fauna is known.

Databases 3A and 3B list all species, by common name and scientific name respectively, recorded on Australian islands, their mean adult body weight (MABW) (King 1983; Guiler 1985; Burbidge and McKenzie 1989), whether species lie within the critical weight range of Burbidge and McKenzie (1989), their diet (**c**: carnivore and insectivore, **o**: omnivore, **h**: herbivore) and their status as listed by ANZECC in April 1991 (**e**: endangered, **v**: vulnerable, ANPWS 1991) are also included.

Database 4A lists references authenticating all records in Database 1, in numerical order of reference, while Database 4B lists references in alphabetical order.

DISCUSSION

These databases have several limitations. Database 4 is the most complete. There is a small amount of missing information from Database 2, principally maximum elevation (61 islands), bathymetry (8 islands) and annual rainfall (3 islands). Some body weights were unavailable for Database 3.

Database 1, although comprehensive in that it includes all records known to us, is not representative of Australia's islands. Only a small proportion of islands (Table 1, column C) have at least one species of mammal recorded. However, the statistical distribution of island area is lognormal; many islands are too small to support one mammal species (Abbott, unpublished).

If attention is focused on the larger islands (>100 ha in area), coverage is considerably better (column D, Table 1), with only New South Wales, Queensland and the Northern Territory below average. We hope that these data spur biologists to investigate more islands in these regions.

In addition, the completeness with which the mammal fauna of each island is known is often difficult to assess. There is little problem with larger species, but the smaller, secretive species are probably under-represented in Database 1. For example, although Tasmania has been settled by Europeans for nearly 200 years, it was only in 1976 that the small omnivorous native rodent *Pseudomys novaehollandiae* was discovered there (Hocking 1980).

We recognize several benefits of these databases. First, Database 1 will provide an instant overview of the significance of new records, such as the first record of the insular occurrence of a species. Second, Databases 1 and 2 will facilitate selection of islands should introductions (IUCN 1987) of threatened mammal species be considered by Government conservation authorities. Furthermore, these databases may serve as a guide to the long-term prospects of survival of mammal species on mainland reserves. Finally, but not least, the literature about mammals on Australia's islands is truly scattered. Our collation of this vast amount of information should assist others to appreciate the value of islands in the conservation of mammal species.

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TABLE 1

Representativeness of Database 1

POLITICAL UNIT	NO. ISLANDS[a]	NO. ISLANDS > 100 ha	(%)	NO. ISLANDS IN DATABASE 2	(%)	NO. ISLANDS WITH AREA >100 ha IN DATABASE 2	(%)
	A	B	(B/A)	C	(C/A)	D	(D/B)
Western Australia	3 678	259	(7.0)	169	(4.6)	82	(31.7)
South Australia	396	35	(8.0)	70	(17.7)	25	(71.4)
Victoria	246	23	(9.4)	28	(11.4)	13	(56.5)
Tasmania	804	42	(5.2)	63	(7.8)	35	(83.3)
New South Wales	439	33	(7.5)	14	(3.2)	1	(3.0)
Queensland	1 854	240	(12.9)	88	(4.8)	61	(25.4)
Northern Territory	879	156	(17.8)	40	(4.6)	38	(24.4)
(Australia)	(8 296)	(788)	(9.5)	(472)	(5.7)	(255)	(32.4)

[a] excludes rocks or islets that are awash. Seven remote islands which are political dependencies of Australia, and more than 300 km distant from land, are also excluded.

Source: Abbott (unpublished)

DATABASE 1A: CATALOGUE OF MAMMAL SPECIES AND OCCURRENCE ON ISLANDS

ISLAND, STATE/TERRITORY, AREA (ha)	STATUS	REF. NO.

TACHYGLOSSUS ACULEATUS, Tachyglossidae - Short-beaked Echidna

Bigge, WA, 17850 ha		16
Bribie, QLD, 17500 ha		10
Bruny, TAS, 36735 ha		59,301
Burrup, WA, 11804 ha		338
Cape Barren, TAS, 46220 ha		7,22, 301
Curtis, QLD, 56345 ha		294
Dunk, QLD, 650 ha		77,257
Fantome, QLD, 635 ha		78
Flinders, TAS, 134720 ha		1,7,22, 301
Fraser, QLD, 165400 ha		10
French, VIC, 17470 ha		53,73
Great Palm, QLD, 5590 ha		78
Groote Eylandt, NT, 225820 ha		12
Hinchinbrook, QLD, 31756 ha		295
Kangaroo, SA, 450000 ha		1,11
King, TAS, 110000 ha		7,301
Maria, TAS, 10401 ha	43 introduced 1971	59,292. 312
Melville, NT, 573000 ha		284
North Stradbroke, QLD, 26344 ha		15
Orpheus, QLD, 1160 ha		294
Phillip, VIC, 10116 ha		53,73
Rotamah, Lake Victoria, VIC, 340 ha		73,145
Saddleback, QLD, 53 ha	? introduced	294
Tasmania, TAS, 6200000 ha		1,4,301
Vansittart, TAS, 765 ha	introduced	7,22

ORNITHORHYNCHUS ANATINUS, Ornithorhynchidae - Platypus

Bruny, TAS, 36735 ha	? record	301,310
Kangaroo, SA, 450000 ha	introduced	11
King, TAS, 110000 ha		7,301, 310
Tasmania, TAS, 6200000 ha		1,4,301
Three Hummock, TAS, 7110 ha	? record	7,301, 310

THYLACINUS CYNOCEPHALUS, Thylacinidae - Thylacine

Tasmania, TAS, 6200000 ha	probably extinct	1,4

ANTECHINUS FLAVIPES, Dasyuridae - Mardo, Yellow-footed Antechinus

Fraser, QLD, 165400 ha		10
Michaelmas, WA, 93 ha		3
Middle Doubtful, WA, 58 ha		3

ANTECHINUS MINIMUS, Dasyuridae - Swamp Antechinus

Bruny, TAS, 36735 ha		148,301
Clarke, TAS, 8391 ha		7,22, 301
Flat Witch, TAS, 65 ha		56,181, 301
Flinders, TAS, 134720 ha		7,22,54 55,301
Great Glennie, VIC, 119 ha		17,55, 73
Hunter, TAS, 7182 ha		301
Ile du Golfe, TAS, 70 ha		186
King, TAS, 110000 ha		7,301
Maatsuyker, TAS, 176 ha		56,57, 161,301
Mount Chappell, TAS, 341 ha		301
Prime Seal, TAS, 1219 ha		7,22, 301
Rabbit, VIC, 26 ha		296
Snake, VIC, 4623 ha		73
Tasmania, TAS, 6200000 ha		1,4,301
Three Hummock, TAS, 7110 ha	? species	7
Waterhouse, TAS, 293 ha		7

ANTECHINUS SWAINSONII, Dasyuridae - Dusky Antechinus

Bruny, TAS, 36735 ha		301
Sunday, VIC, 1034 ha	? species	17
Tasmania, TAS, 6200000 ha		1,4,301

DASYKALUTA ROSAMONDAE, Dasyuridae - Little Red Antechinus

Burrup, WA, 11804 ha		338

DASYURUS HALLUCATUS, Dasyuridae - Northern Quoll

Augustus, WA, 19023 ha		3,16
Bathurst, NT, 164520 ha		1
Bigge, WA, 17850 ha		16
Boongaree, WA, 4935 ha		3,16
Burrup, WA, 11804 ha		338
Caffarelli, WA, 230 ha		41
Carlia, WA, 450 ha	? species	16
Dolphin, WA, 3281 ha		28
Groote Eylandt, NT, 225820 ha		12,18
Hidden, WA, 1974 ha		41
Koolan, WA, 2712 ha		3
Marchinbar, NT, 21190 ha		276
Melville, NT, 573000 ha		1
Sir Frederick, WA, 389 ha		41
Uwins, WA, 3240 ha		3,16
Vanderlin, NT, 27690 ha		275
Wollaston, WA, 798 ha		16

DASYURUS MACULATUS, Dasyuridae - Spotted-tailed Quoll

Flinders, TAS, 134720 ha	extinct	7
Kangaroo, SA, 450000 ha	extinct	1,11
King, TAS, 110000 ha	extinct	7
Tasmania, TAS, 6200000 ha		1,4,301

DASYURUS VIVERRINUS, Dasyuridae - Eastern Quoll

Bruny, TAS, 36735 ha		301,310
Kangaroo, SA, 450000 ha	extinct	11
Tasmania, TAS, 6200000 ha		1,4,301

NINGAUI TIMEALEYI, Dasyuridae - Pilbara Ningaui

Burrup, WA, 11804 ha		338

PARANTECHINUS APICALIS, Dasyuridae - Dibbler

Boullanger, WA, 34 ha		3,35
Whitlock, WA, 5 ha		35

PHASCOGALE TAPOATAFA, Dasyuridae - Brush-tailed Phascogale

Kangaroo, SA, 450000 ha	extinct	11
West, Sir Ed Pellew, NT, 13373 ha		275

PLANIGALE INGRAMI, Dasyuridae - Long-tailed Planigale

North Peron, NT, 1766 ha		276

PLANIGALE MACULATA, Dasyuridae - Common Planigale

Barrow, WA, 23590 ha		14
Bentinck, QLD, 13800 ha		18
Burrup, WA, 11804 ha		338
Groote Eylandt, NT, 225820 ha		12,18
Russell, QLD, 1748 ha		74
Vanderlin, NT, 27690 ha		275

PSEUDANTECHINUS MACDONNELLENSIS, Dasyuridae - Fat-tailed Antechinus

Barrow, WA, 23590 ha		3,25

PSEUDANTECHINUS MIMULUS, Dasyuridae - Carpentarian Antechinus

Centre, Sir Ed Pellew, NT, 9222 ha		275

North, Sir Ed Pellew, NT, 5778 ha		272,275
South West, Pellew, NT, 9517 ha		275

PSEUDANTECHINUS NINGBING, Dasyuridae - Ningbing Antechinus

Augustus, WA, 19023 ha		16
South Heywood, WA, 768 ha		3,16

SARCOPHILUS HARRISII, Dasyuridae - Tasmanian Devil

Tasmania, TAS, 6200000 ha		1,4,301

SMINTHOPSIS AITKENI, Dasyuridae - Kangaroo Island Dunnart

Kangaroo, SA, 450000 ha	early reference record as *Sminthopsis murina*	24,11 76

SMINTHOPSIS DOLICHURA, Dasyuridae - Little Long-tailed Dunnart

Dirk Hartog, WA, 58640 ha		3

SMINTHOPSIS GRISEOVENTER, Dasyuridae - Grey-bellied Dunnart

Boullanger, WA, 34 ha		3,35

SMINTHOPSIS LEUCOPUS, Dasyuridae - White-footed Dunnart

Bruny, TAS, 36735 ha		301
Cape Barren, TAS, 46220 ha		301
Clarke, TAS, 8391 ha		7,22, 301
East Sister, TAS, 519 ha	introduced	22,301
Tasmania, TAS, 6200000 ha		1,4,301
West Sister, TAS, 714 ha		7,22, 301

SMINTHOPSIS MURINA, Dasyuridae - Common Dunnart

Fraser, QLD, 165400 ha		10

SMINTHOPSIS VIRGINIAE, Dasyuridae - Red-cheeked Dunnart

Melville, NT, 573000 ha		18,8

ISOODON AURATUS, Peramelidae - Golden Bandicoot

Augustus, WA, 19023 ha		3,16
Barrow, WA, 23590 ha		3,25
Boomerang, WA, 5 ha	connects to Barrow Is. at low tide	218
Hermite, WA, 836 ha	extinct	26
Middle (near Barrow), WA, 350 ha		3
Sunday, WA, 1157 ha	? species	266

ISOODON MACROURUS, Peramelidae - Brindled Bandicoot

Bathurst, NT, 164520 ha		8,307
Centre, Sir Ed Pellew, NT, 9222 ha		275
Elcho, NT, 26950 ha		18
Fraser, QLD, 165400 ha		10
Great Palm, QLD, 5590 ha	? species	68
Groote Eylandt, NT, 225820 ha		12,18
Hinchinbrook, QLD, 31756 ha		295
Indian, NT, 2781 ha		276
Long, QLD, 987 ha	? extinct, last reported mid-1960s	294
Maria, NT, 3729 ha		276
Melville, NT, 573000 ha		8,307
Moreton, QLD, 17021 ha		10,257
Mutton Bird, NSW, 8 ha	? species, natural spread	163
Newry, QLD, 51 ha		294
North Stradbroke, QLD, 26344 ha		10,15, 257
Orpheus, QLD, 1160 ha		294
Rabbit, QLD, 312 ha		294
Saint Andrew, WA, 1525 ha		16

ISOODON OBESULUS, Peramelidae - Quenda, Southern Brown Bandicoot

Bruny, TAS, 36735 ha		301
Culeenup, WA, 51 ha		271
Daw, WA, 212 ha		3
Flinders, TAS, 134720 ha	extinct	7,22
Franklin, SA, 512 ha		19,45, 107,244 245,252
Kangaroo, SA, 450000 ha		1,11
Maria, TAS, 10401 ha	introduced 1971	42,292, 301, 312
Saint Francis, SA, 809 ha		19,45, 252
Tasmania, TAS, 6200000 ha		1,4,301
Three Hummock, TAS, 7110 ha		7
West Sister, TAS, 714 ha		7,22, 301

PERAMELES BOUGAINVILLE, Peramelidae - Western Barred Bandicoot

Bernier, WA, 4267 ha		3,27
Dorre, WA, 5163 ha		3,27

PERAMELES GUNNII, Peramelidae - Eastern Barred Bandicoot

Bruny, TAS, 36735 ha		301
Maria, TAS, 10401 ha	55 introduced 1971	292 301,312
Tasmania, TAS, 6200000 ha		1,4,301

PERAMELES NASUTA, Peramelidae - Long-nosed Bandicoot

Badu (=Mulgrave), QLD, 10530 ha	introduced, "within living memory"	236
Fraser, QLD, 165400 ha		10
Hinchinbrook, QLD, 31756 ha		215,295

LASIORHINUS LATIFRONS, Vombatidae - Southern Hairy-nosed Wombat

Kangaroo, SA, 450000 ha	introduced, 1pair, failed to establish	11
Wedge, SA, 967 ha	introduced 1971	45,270

VOMBATUS URSINUS, Vombatidae - Common Wombat

Cape Barren, TAS, 46220 ha	extinct	7
Clarke, TAS, 8391 ha	extinct	7
Flinders, TAS, 134720 ha		7,22, 301
King, TAS, 110000 ha	extinct	7
Maria, TAS, 10401 ha	28 introduced from Flinders Is. in 1971	292,312
Phillip, VIC, 10116 ha		73
Rotamah, Lake Victoria, VIC, 340 ha		144,145
Tasmania, TAS, 6200000 ha		1,4,301

PHASCOLARCTOS CINEREUS, Phascolarctidae - Koala

Bribie, QLD, 17500 ha		257
Chinaman, VIC, 50 ha	introduced 1930, 1931, 1957	17,73 297
French, VIC, 17470 ha	introduced between 1880 and 1900	17,53 73,297
Kangaroo, SA, 450000 ha	introduced	1,11
Little Snake, VIC, 486 ha	introduced	17
Magnetic, QLD, 5212 ha	introduced	294
Newry, QLD, 51 ha	introduced	294
North Stradbroke, QLD, 26344 ha		10,15
Phillip, VIC, 10116 ha	introduced 1923	17,53, 73,297
Quail, VIC, 480 ha	introduced 1930, 1931, 1932, 1933, 1947	73,297

Rabbit, QLD, 312 ha	introduced	294
Raymond, Lake Victoria, VIC, 769 ha	introduced 1953	73,149 297
Saint Bees, QLD, 987 ha	? introduced	60
Saint Margaret, VIC, 1934 ha		73
Snake, VIC, 4623 ha	introduced 1945	17,297
Three Hummock, TAS, 7110 ha	introduced,failed to establish	7

BETTONGIA GAIMARDII, Potoridae - Tasmanian Bettong

Bruny, TAS, 36735 ha		59,301
Maria, TAS, 10401 ha	123 introduced 1971	292, 301 312
Tasmania, TAS, 6200000 ha		1,4,301

BETTONGIA PENICILLATA, Potoridae - Woylie, Brush-tailed Bettong

Baird, SA, 18 ha	introduced 1982	45,46, 270
Bird Club, SA, 8 ha	introduced 1979, now absent	270
Kangaroo, SA, 450000 ha	? record, extinct	1
Saint Francis, SA, 809 ha	extinct, re-introduced 1980s	252,45
Saint Peter, SA, 3731 ha	?species,extinct re-introduced 1989	252
Venus Bay, island A N, SA, 17 ha	introduced 1980 ? status	45,45, 270
Wedge, SA, 967 ha	introduced 1983	45,46, 270

POTOROUS TRIDACTYLUS, Potoridae - Long-nosed Potoroo

Bruny, TAS, 36735 ha		59,147, 301
Cape Barren, TAS, 46220 ha	extinct	7,22
Clarke, TAS, 8391 ha	extinct	7,22
De Witt, TAS, 518 ha	? species	56,180
French, VIC, 17470 ha		17,53, 54,73
Hunter, TAS, 7182 ha		7
King, TAS, 110000 ha		7,301
Louisa, TAS, 21 ha	joined to Tasmania periodically by tombolo	56,179
Maria, TAS, 10401 ha	136 introduced 1971	59,292, 301,312
Phillip, VIC, 10116 ha	? record	54,73
Robbins, TAS, 9835 ha		7
Tasmania, TAS, 6200000 ha		1,4,301
Three Hummock, TAS, 7110 ha		7
Walker, TAS, 634 ha		7

BETTONGIA LESUEUR, Macropodidae - Boodie, Burrowing Bettong

Barrow, WA, 23590 ha		3,14,25
Bernier, WA, 4267 ha		3,27
Boodie, WA, 170 ha	extinct 1988	9
Dirk Hartog, WA, 58640 ha	extinct	2
Dorre, WA, 5163 ha		3,27
Kangaroo, SA, 450000 ha	introduced 1924, 1926, now extinct	11

LAGORCHESTES CONSPICILLATUS, Macropodidae Spectacled Hare-wallaby

Barrow, WA, 23590 ha		3,14,25
Hermite, WA, 836 ha	extinct	3,26

LAGORCHESTES HIRSUTUS, Macropodidae - Mala, Rufous Hare-wallaby

Bernier, WA, 4267 ha		3,27
Dorre, WA, 5163 ha		3,27

LAGOSTROPHUS FASCIATUS, Macropodidae - Banded Hare-wallaby

Bernier, WA, 4267 ha		3,27
Dirk Hartog, WA, 58640 ha	extinct, re-introduced 1970s, not successful	3,27
Dorre, WA, 5163 ha		3,27

MACROPUS AGILIS, Macropodidae - Agile Wallaby

#Crocodile (group), NT	? record	69
Albany, QLD, 616 ha	? record	69
Bathurst, NT, 164520 ha		18,69, 307
Bremer, NT, 1374 ha		282
Centre, Sir Ed Pellew, NT, 9222 ha		13,275
Denham, QLD, 3034 ha		69
Elcho, NT, 26950 ha		18,69
Friday, QLD, 500 ha		228
Groote Eylandt, NT, 225820 ha		69
Hinchinbrook, QLD, 31756 ha		69,215, 295
Labu, NT, 40 ha		275
Lingnoonganee, QLD, 1103 ha		69
Long, QLD, 987 ha	introduced, now absent	294
Mai (adj. Albany), QLD, 18 ha	? species	70
Melville, NT, 573000 ha	? record, ? species	69,307
Mornington, QLD, 97020 ha		69
North Peron, NT, 1766 ha	? record, ? species	69
North Stradbroke, QLD, 26344 ha		10,15, 69
North, Sir Ed Pellew, NT, 5778 ha		13,275
Skull, NT, 635 ha	? record, ? species	69
South Peron, NT, 485 ha	? record, ? species	69
South West, Pellew, NT, 9517 ha		275
Sydney, QLD, 1026 ha		69
Vanderlin, NT, 27690 ha		13,275
Watson, NT, 1322 ha		13

MACROPUS EUGENII, Macropodidae - Tammar Wallaby

Boston, SA, 967 ha	introduced 1971 ex Kangaroo Is.	45,269 270,274
East Wallabi, WA, 307 ha		3,48
Flinders, SA, 3642 ha	extinct between 1968-1974	45,246, 247, 252,269
Garden, WA, 1054 ha		1,3
Granite, SA, 32 ha	introduced ?1970s ex Kangaroo Is., being removed	45,269, 270
Greenly, SA, 141 ha	introduced 1905 ex Kangaroo Is.	149, 252, 269, 270, 279
Kangaroo, SA, 450000 ha		1,3,11
Middle (Recherche), WA, 1036 ha		3,191
North (Abrolhos), WA, 176 ha	introduced ex Wallabi Is 1950s?, died out, re-introduced 1987	3,42
North Twin Peak, WA, 272 ha		3,39
Saint Peter, SA, 3731 ha	extinct	45
Thistle, SA, 4113 ha	extinct, ca 1855	90
West Wallabi, WA, 587 ha		3,48

MACROPUS FULIGINOSUS, Macropodidae - Western Grey Kangaroo

Ballee, WA, 19 ha		271

Boullanger, WA, 34 ha	introduced, single animal in 1985, absent 1991	49
Culeenup, WA, 51 ha		271
Germein, SA, 173 ha	natural spread	45
Granite, SA, 32 ha	introduced, removed 1984	45,270
Jeegarnyeejip, WA, 15 ha		271
Kangaroo, SA, 450000 ha		1,11
Mt Dutton Bay (SW), SA, 3 ha	natural spread	45
Taylor, SA, 255 ha	introduced	45
Woody, WA, 108 ha	introduced before 1976, present 1992	71,188
Yangie Bay, SA, 6 ha	natural spread	45
Yunderup, WA, 8 ha		271

MACROPUS GIGANTEUS, Macropodidae - Eastern Grey Kangaroo

Brampton, QLD, 433 ha	introduced	223
Bribie, QLD, 17500 ha		10,257
Carlisle, QLD, 550 ha	? natural spread from Brampton Is.	81,223
Curtis, QLD, 56345 ha		294
Fraser, QLD, 165400 ha		10
Heron, QLD, 13 ha	introduced, now absent	156
Little Snake, VIC, 486 ha	natural spread	17
Long, QLD, 987 ha	introduced, now absent	294
Maria, TAS, 10401 ha	45 introduced in 1969-70	59,292 301, 312,313
Middle Percy, QLD, 1969 ha	? species, introduced	258
North Stradbroke, QLD, 26344 ha		10,15
Rotamah, Lake Victoria, VIC, 340 ha		73,144, 145
Snake, VIC, 4623 ha	extinct	17,73
South Molle, QLD, 380 ha	introduced 1987, ? all same sex	294
Sunday, VIC, 1034 ha	natural spread	17
Tasmania, TAS, 6200000 ha		1,4,301

MACROPUS PARRYI, Macropodidae - Whiptail Wallaby

Heron, QLD, 13 ha	introduced, now absent	156

MACROPUS ROBUSTUS, Macropodidae - Euro, Common Wallaroo

Burrup, WA, 11804 ha		338
Dixon, WA, 495 ha		72
Dolphin, WA, 3281 ha		28
East Intercourse, WA, 300 ha	before causeway to mainland	216
Hook, QLD, 6161 ha	introduced, now absent	294
Simpson, WA, 78 ha		3
Tozer, WA, 15 ha	connected to Dolphin Is. at low tide	216
West Intercourse, WA, 2300 ha		216

MACROPUS ROBUSTUS ISABELLINUS - Barrow Island Euro

Barrow, WA, 23590 ha		25,14

MACROPUS RUFOGRISEUS, Macropodidae - Red-necked Wallaby

Babel, TAS, 430 ha	introduced ca 1965	22
Badger, TAS, 1235 ha	? extinct	7,22, 301
Bruny, TAS, 36735 ha		59
Cape Barren, TAS, 46220 ha		7,22, 301
Clarke, TAS, 8391 ha	extinct	7,22,
Deal, TAS, 1722 ha		7
Flinders, TAS, 134720 ha		7,22, 301
Hunter, TAS, 7182 ha	? extinct	7
King, TAS, 110000 ha		7,301
Maria, TAS, 10401 ha	127 introduced 1969-70	292, 301, 312, 313
Preservation, TAS, 198 ha	extinct	7
Robbins, TAS, 9835 ha		7
Tasmania, TAS, 6200000 ha		1,4,301
Three Hummock, TAS, 7110 ha	? extinct	7
Vansittart, TAS, 765 ha	extinct	7,22
Walker, TAS, 634 ha		7

MACROPUS RUFUS, Macropididae - Red Kangaroo

Burrup, WA, 11804 ha	1 dead specimen, possibly transported	338

ONYCHOGALEA UNGUIFERA, Macropidae - Northern Nailtail Wallaby

Groote Eylandt, NT, 225820 ha		284

PETROGALE ASSIMILIS, Macropodidae - Allied Rock-wallaby

Great Palm, QLD, 5590 ha		1,305
Magnetic, QLD, 5212 ha		1,294

PETROGALE BRACHYOTIS, Macropodidae - Short-eared Rock-wallaby

Alger, NT, 778 ha	? species	69
Astell, NT, 1143 ha	? species	69
Bumaga, NT, 333 ha	? species	69
Centre, Sir Ed Pellew, NT, 9222 ha		69,275
Cotton, NT, 1974 ha	? species	69
Djeegaree, NT, 290 ha	? record, ? species	69
Drysdale, NT, 5450 ha	? record, ? species	69
Graham, NT, 784 ha	? record, ? species	69
Groote Eylandt, NT, 225820 ha		1
Guluwuru, NT, 7625 ha	? record, ? species	69
Inglis, NT, 8830 ha	? record, ? species	69
Jirrgarri, NT, 701 ha	? record, ? species	69
Marchinbar, NT, 21190 ha		69,276, 308
North, Sir Ed Pellew, NT, 5778 ha	?species	69,275
Raragala, NT, 9232 ha	? record, ? species	69
Rimbija, NT, 211 ha	? record, ? species	69
Vanderlin, NT, 27690 ha	? species	69,275
Warnawi, NT, 194 ha	? record, ? species	69

PETROGALE BURBIDGEI, Macropodidae - Monjon

Bigge, WA, 17850 ha		3,16,47
Boongaree, WA, 4935 ha		3,16,47
Katers, WA, 1775 ha		3,16,47
Uwins, WA, 3240 ha	? species	16
Wollaston, WA, 798 ha	? species	16

PETROGALE CONCINNA, Macropodidae - Nabarlek

Augustus, WA, 19023 ha		3,16
Borda, WA, 728 ha		3,16
Darcy (=North Heywood), WA, 4945 ha	? species	16
Groote Eylandt, NT, 225820 ha		1
Hidden, WA, 1974 ha		3,44
Long, WA, 1356 ha		3,41
Milingimbi, NT, 5236 ha		18
Sunday, WA, 1157 ha	extinct, approx. 1940	266
Wigram, NT, 2061 ha		282

PETROGALE INORNATA, Macropodidae - Unadorned Rock-wallaby

Whitsunday, QLD, 10526 ha		294

PETROGALE LATERALIS, Macropodidae - Black-footed Rock-wallaby

Barrow, WA, 23590 ha		25
Depuch, WA, 1121 ha	extinct	3,36,37
Mondrain, WA, 810 ha		3,187
Pearson, north, SA, 164 ha		1,19,44 45,250, 252
Pearson, south, SA, 39 ha	ex Pearson, north, accidentally released 1960	251,270
Salisbury, WA, 368 ha		3
Thistle, SA, 4113 ha	introduced 1974	45,270
Wedge, SA, 967 ha	introduced 1975	45,270
West, SA, 14 ha	introduced 1973, 1975, now absent	45,168, 270
Westall (=Combe), WA, 70 ha		1,39
Wilson, WA, 90 ha		1,3,39

PETROGALE PERSEPHONE, Macropodidae - Proserpine Rock-wallaby

Gloucester, QLD, 2484 ha		274,294

PETROGALE ROTHSCHILDI, Macropodidae - Rothschild's Rock-wallaby

Burrup, WA, 11804 ha		338,339
Dolphin, WA, 3281 ha	declined	28
Enderby, WA, 3190 ha		3,28
Rosemary, WA, 1152 ha		3,28
West Lewis, WA, 1974 ha	15 (8m, 7f) introduced 1982, widespread in 1991	104

SETONIX BRACHYURUS, Macropodidae - Quokka

Bald, WA, 720 ha		1,3,189
Rottnest, WA, 1705 ha		1,3,162

THYLOGALE BILLARDIERI, Macropodidae - Tasmanian Pademelon

Babel, TAS, 430 ha	? extinct, ref. 200 says common	7,22, 200
Badger, TAS, 1235 ha	extinct	7,22
Bruny, TAS, 36735 ha		59,301
Cape Barren, TAS, 46220 ha		7,22, 301
Clarke, TAS, 8391 ha		7,22, 301
De Witt, TAS, 518 ha		56,180, 301,310
Deal, TAS, 1722 ha	extinct	7
East Kangaroo, TAS, 147 ha	extinct	7,22
East Sister, TAS, 519 ha		7,22, 301
Erith-Dover, TAS, 678 ha	extinct	7
Flinders, TAS, 134720 ha		7,22, 301
Great Dog, TAS, 377 ha	extinct	7,22
Hunter, TAS, 7182 ha		7,301
King, TAS, 110000 ha		7,301
Long, TAS, 307 ha	extinct	7,22
Louisa, TAS, 21 ha	natural spread, joined to Tasmania by tombolo	56,179, 310
Maria, TAS, 10401 ha	13 introduced 1971	59,292, 301,312
Phillip, VIC, 10116 ha	single record 1840, now extinct	73
Preservation, TAS, 198 ha	extinct	22
Prime Seal, TAS, 1219 ha		7,22, 301
Robbins, TAS, 9835 ha		7
Schouten, TAS, 2681 ha		59
Tasmania, TAS, 6200000 ha		1,4,301
Three Hummock, TAS, 7110 ha	?extinct re-introduced	7,301
Vansittart, TAS, 765 ha	extinct	7,22
Walker, TAS, 634 ha		7
West Sister, TAS, 714 ha		7,22, 301

WALLABIA BICOLOR, Macropodidae - Swamp Wallaby

Bribie, QLD, 17500 ha		10,257
Chinaman, VIC, 50 ha		73
Fraser, QLD, 165400 ha		1,10
Hummock, VIC, 313 ha		73
Little Snake, VIC, 486 ha	natural spread	17,73
North Stradbroke, QLD, 26344 ha		1,10,15, 257
Phillip, VIC, 10116 ha		73,80
Rotamah, Lake Victoria, VIC, 340 ha		73,144, 145
Snake, VIC, 4623 ha	extinct	17,73
Sunday, VIC, 1034 ha	natural spread, exterminated by dogs 1950?	17

ACROBATES PYGMAEUS, Phalangeridae - Feathertail Glider

Fraser, QLD, 165400 ha		10
North Stradbroke, QLD, 26344 ha		15

TRICHOSURUS ARNHEMENSIS, Phalangeridae - Northern Brushtail Possum

Barrow, WA, 23590 ha		3,25
Bathurst, NT, 164520 ha		8,18, 307
Boomerang, WA, 5 ha	connects to Barrow Is. at low tide	218
Croker, NT, 31000 ha		18
Elcho, NT, 26950 ha		18
Melville, NT, 573000 ha		8,18, 307
North Peron, NT, 1766 ha		276
South Peron, NT, 485 ha		276

TRICHOSURUS CANINUS, Phalangeridae - Mountain Brushtail Possum

Fraser, QLD, 165400 ha		10

TRICHOSURUS VULPECULA, Phalangeridae - Common Brushtail Possum

Bribie, QLD, 17500 ha		10
Brisk, QLD, 48 ha	? species	78
Bruny, TAS, 36735 ha		147,291
Culeenup, WA, 51 ha		271
Deal, TAS, 1722 ha		7,139
Dent, QLD, 338 ha	introduced by lighthouse keepers	294
East Sister, TAS, 519 ha	introduced 1920s	7,22
Erith-Dover, TAS, 678 ha		7
Fantome, QLD, 635 ha	? species	78
Flinders, TAS, 134720 ha		7,22, 301
Great Palm, QLD, 5590 ha	? species	78
Hunter, TAS, 7182 ha		7,301
Kangaroo, SA, 450000 ha		1,3,11
King, TAS, 110000 ha		7,301
Maria, TAS, 10401 ha	15 introduced 1971	59,292, 312
Moreton, QLD, 17021 ha		10
Newry, QLD, 51 ha	? introduced	294
North Keppel, QLD, 436 ha	introduced	224
North Stradbroke, QLD, 26344 ha		10,15
Outer Newry, QLD, 49 ha	? introduced	294
Phillip, VIC, 10116 ha		73
Prime Seal, TAS, 1219 ha	introduced 1920s	7,22, 301
Rabbit, QLD, 312 ha	? introduced	294
Robbins, TAS, 9835 ha		7

Rotamah, Lake Victoria, VIC, 340 ha		145
Tasmania, TAS, 6200000 ha		1,4,301
Taylor, SA, 255 ha		45
Thistle, SA, 4113 ha		45
Three Hummock, TAS, 7110 ha		7,301
Whitsunday, QLD, 10526 ha		294

WYULDA SQUAMICAUDATA, Phalangeridae - Scaly-tailed Possum

Bigge, WA, 17850 ha		3,16
Boongaree, WA, 4935 ha		3,16

PETAURUS BREVICEPS, Petauridae - Sugar Glider

Augustus, WA, 9023 ha		3,16
Bathurst, NT, 164520 ha		1,18, 307
Curtis, QLD, 56345 ha		294
Elcho, NT, 26950 ha		18
Fraser, QLD, 165400 ha	? species	10
Groote Eylandt, NT, 225820 ha		1,12,18
Hinchinbrook, QLD, 31756 ha	?species	295
Melville, NT, 573000 ha		1,18, 276,307
Moreton, QLD, 17021 ha	? species	10
North Stradbroke, QLD, 26344 ha	? species	10,15
Rabama (=Yabooma?),NT, 2653 ha		151
Tasmania, TAS, 6200000 ha	introduced ca 1835	1,4,301
Wigram, NT, 2061 ha		69,277, 282

PSEUDOCHEIRUS DAHLI, Petauridae - Rock Ringtail Possum

Groote Eylandt, NT, 225820 ha		1,18

PSEUDOCHEIRUS PEREGRINUS, Petauridae - Common Ringtail Possum

Bribie, QLD, 7500 ha		10
Cape Barren, TAS, 46220 ha		7,22, 291,301
Flinders, TAS, 134720 ha		7,22
Flinders, TAS, 134720 ha		7,22, 301
Kangaroo, SA, 450000 ha	introduced	11
King, TAS, 110000 ha		7,301
Maria, TAS, 10401 ha	61 introduced 1971	59,292, 301,312
Phillip, VIC, 10116 ha		73
Rotamah, Lake Victoria, VIC, 340 ha		145
Tasmania, TAS, 6200000 ha		1,4,301

CERCARTETUS CONCINNUS, Burramyidae - Western Pygmy-possum

Kangaroo, SA, 450000 ha		1,11

CERCARTETUS LEPIDUS, Burramyidae - Little Pygmy-possum

Bruny, TAS, 36735 ha		301
Kangaroo, SA, 450000 ha		1,11
Tasmania, TAS, 6200000 ha		1,4,301

CERCARTETUS NANUS, Burramyidae - Eastern Pygmy-possum

Cape Barren, TAS, 46220 ha	?species	7,22
Flinders, TAS, 134720 ha		7,22, 301
King, TAS, 110000 ha		7,301
Maria, TAS, 10401 ha		59,301, 312
Rotamah, Lake Victoria, VIC, 340 ha		73,145
Snake, VIC, 4623 ha		73
Sunday, VIC, 1034 ha		17,73
Tasmania, TAS, 6200000 ha		1,4,301

MACROGLOSSUS MINIMUS, Pteropodidae - Northern Blossom-bat

Gibbings, WA, 289 ha		41
Hidden, WA, 1974 ha		41
Irvine, WA, 967 ha		41
King, TAS, 110000 ha	extinct	100
Marchinbar, NT, 21190 ha		276
Melville, NT, 573000 ha		18
Sunday, WA, 1157 ha		41

NYCTIMENE ROBINSONI, Pteropodidae - Queensland Tube-nosed Bat

Hinchinbrook, QLD, 31756 ha		215,295
Magnetic, QLD, 5212 ha		226

PTEROPUS ALECTO, Pteropodidae - Black Flying-fox

Augustus, WA, 19023 ha	? species	16
Bathurst, NT, 164520 ha		1
Boongaree, WA, 4935 ha		3,16
Carlisle, QLD, 550 ha	? species	223
Depuch, WA, 1121 ha	? species	3
Fraser, QLD, 165400 ha		1
Gloucester, QLD, 2484 ha		294
Groote Eylandt, NT, 225820 ha		1
Haslewood, QLD, 720 ha		294
Hook, QLD, 6161 ha	colony	294
Koolan, WA, 2712 ha		3
Lachlan, WA, 1296 ha		41
Lindeman, QLD, 610 ha	colony	294
Lizard, QLD, 850 ha		279
Long, QLD, 987 ha	colony	294
Magnetic, QLD, 5212 ha		226,257
Marchinbar, NT, 21190 ha		276
Maria, NT, 3729 ha		276
Melville, NT, 573000 ha		1
Night, QLD, 61 ha	5000+	317
North Coronation, WA, 4038 ha		3,16
North Keppel, QLD, 436 ha		223
Saint Andrew, WA, 1525 ha		16
Seaforth, QLD, 21 ha	colony	294
South Molle, QLD, 380 ha	colony	294

PTEROPUS BRUNNEUS, Pteropodidae

#Percy (islands), QLD	holotype, ? extinct	294

PTEROPUS CONSPICILLATUS, Pteropodidae - Spectacled Flying-fox

Cliff, QLD, 37 ha	? species	317
Fitzroy, QLD, 325 ha	holotype	294

PTEROPUS MELANOTUS, Pteropodidae

Christmas, COM, 13470 ha		261

PTEROPUS POLIOCEPHALUS, Pteropodidae - Grey-headed Flying-fox

Babel, TAS, 430 ha		7
Carlisle, QLD, 550 ha		223
Fraser, QLD, 165400 ha		1,10, 257
Great Dog, TAS, 377 ha		7
King, TAS, 110000 ha		7
Moreton, QLD, 17021 ha		10,93, 257
North Stradbroke, QLD, 26344 ha		10,257
Phillip, VIC, 10116 ha		73

PTEROPUS SCAPULATUS, Pteropodidae - Little Red Flying-fox

#Claremont (isles), QLD	(holotype *P. elseyii*)	294
Booby, QLD, 6 ha	occasional visitor	207
Burrup, WA, 11804 ha	vagrant	338
Elcho, NT, 26950 ha		18
Enderby, WA, 3190 ha		216
Groote Eylandt, NT, 225820 ha		284
Kangaroo, SA, 450000 ha		11
King Hall, WA, 209 ha		41
Rabama (=Yabooma?), NT, 2653 ha	? species	151
South Mangrove, WA, 29 ha		220

PTEROPUS SP., Pteropodidae

Carlisle, QLD, 550 ha		257
Christmas, COM, 13470 ha		254
Curtis, QLD, 56345 ha		294
Moreton, QLD, 17021 ha		257

SYCONYCTERIS AUSTRALIS, Pteropodidae - Queensland Blossom-bat

Fraser, QLD, 165400 ha		1
Hinchinbrook, QLD, 31756 ha		215,295
Magnetic, QLD, 5212 ha		226

TAPHOZOUS AUSTRALIS, Emballuronidae - North-eastern Sheathtail-bat

Albany, QLD, 616 ha		257,294
Possession, QLD, 520 ha		311

TAPHOZOUS FLAVIVENTRIS, Emballuronidae - Yellow-bellied Sheathtail-bat

Gibbings, WA, 289 ha		41
Groote Eylandt, NT, 225820 ha		18
Moreton, QLD, 17021 ha		93,311
One Tree, QLD, 5 ha	vagrant	306

TAPHOZOUS GEORGIANUS, Emballuronidae - Common Sheathtail-bat

Augustus, WA, 19023 ha		3,16, 311
Barrow, WA, 23590 ha		25
Bat (Cape Brewster), WA, 7 ha		3,16, 311
Bathurst, WA, 610 ha		41
Bigge, WA, 17850 ha		3,16, 311
Boongaree, WA, 4935 ha		3,16, 311
Burrup, WA, 11804 ha		338
Centre, Sir Ed Pellew, NT, 9222 ha		275,311
Cockatoo, WA, 508 ha		3,311
Dolphin, WA, 3281 ha		216
Gibbings, WA, 289 ha		41
Groote Eylandt, NT, 225820 ha		278
Hidden, WA, 1974 ha		41
Hook, QLD, 6161 ha		294
Koolan, WA, 2712 ha		3,311
Lachlan, WA, 1296 ha		41
Marchinbar, NT, 21190 ha		276
North, Sir Ed Pellew, NT, 5778 ha		275
Sir Frederick, WA, 389 ha		41
Vanderlin, NT, 27690 ha		275

TAPHOZOUS SACCOLAIMUS, Emballuronidae - Naked-rumped Sheathtail-bat

Bathurst, NT, 164520 ha		1
Melville, NT, 573000 ha		1

MACRODERMA GIGAS, Megadermatidae - Ghost Bat

Elcho, NT, 26950 ha		18
Groote Eylandt, NT, 225820 ha		18
Koolan, WA, 2712 ha		3
Milingimbi, NT, 5236 ha		3
North, Sir Ed Pellew, NT, 5778 ha		275

RHINOLOPHUS MEGAPHYLLUS, Rhinolophidae - Eastern Horseshoe-bat

Fraser, QLD, 165400 ha		1
Haslewood, QLD, 720 ha		294
Hook, QLD, 6161 ha		294

HIPPOSIDEROS CERVINUS, Rhinolophidae - Eastern Horseshoe-bat

Albany, QLD, 616 ha	syntype	294

HIPPOSIDEROS ATER, Hippersideridae - Dusky Horseshoe-bat

Augustus, WA, 19023 ha		16
Byam Martin, WA, 810 ha		16
Koolan, WA, 2712 ha	? species	3
Lizard, QLD, 850 ha		279
Milingimbi, NT, 5236 ha	? species	3

HIPPOSIDEROS DIADEMA, Hippersideridae - Diadem Horseshoe-bat

Bathurst, NT, 164520 ha		1
Hinchinbrook, QLD, 31756 ha		215,295
Melville, NT, 573000 ha		1

HIPPOSIDEROS STENOTIS, Hippersideridae - Lesser Wart-nosed Horseshoe-bat

Bathurst, WA, 610 ha		41
Boongaree, WA, 4935 ha		3,16

RHINONICTERUS AURANTIUS, Hippersideridae - Orange Horseshoe-bat

Koolan, WA, 2712 ha		3

CHALINOLOBUS GOULDII, Vespertilionidae - Gould's Wattled Bat

Kangaroo, SA, 450000 ha		1,11
King, TAS, 110000 ha		301
Norfolk, COM, 3450 ha		128
Phillip, VIC, 10116 ha		73
Rotamah, Lake Victoria, VIC, 340 ha		73,145
Tasmania, TAS, 6200000 ha		1,4,301

CHALINOLOBUS MORIO, Vespertilionidae - Chocolate Wattled Bat

Cape Barren, TAS, 46220 ha		301
Flinders, TAS, 134720 ha		301
Kangaroo, SA, 450000 ha		11
Phillip, VIC, 10116 ha		73
Rotamah, Lake Victoria, VIC, 340 ha		73,145
Tasmania, TAS, 6200000 ha		1,4,301

CHALINOLOBUS NIGROGRISEUS, Vespertilionidae - Hoary Bat

Groote Eylandt, NT, 225820 ha		18
Koolan, WA, 2712 ha		3

EPTESICUS CAURINUS, Vespertilionidae

Bat (Cape Brewster), WA, 7 ha		3,5,16
Bathurst, NT, 164520 ha		256
Bathurst, WA, 610 ha		41
Bigge, WA, 17850 ha		3,5
Boongaree, WA, 4935 ha		3,5,16
Deal, TAS, 1722 ha	present in 1890	139
Faure, WA, 5148 ha		262
Gibbings, WA, 289 ha		41
Groote Eylandt, NT, 225820 ha	? species	278
Hidden, WA, 1974 ha		41
Irvine, WA, 967 ha		41
King Hall, WA, 209 ha		41
Lady Julia Percy, VIC, 149 ha	present 1840-1863, now absent	123
Marchinbar, NT, 21190 ha	? species	276
Melville, NT, 573000 ha		256
Norfolk, COM, 3450 ha		128
Sunday, WA, 1157 ha		41

EPTESICUS DARLINGTONI, Vespertilionidae - Darlington's Eptesicus

Flinders, TAS, 134720 ha		5,7
Kangaroo, SA, 450000 ha		5,11
Phillip, VIC, 10116 ha		73
Rotamah, Lake Victoria, VIC, 340 ha		73
Tasmania, TAS, 6200000 ha		1,5,301

EPTESICUS FINLAYSONI, Vespertilionidae - Finlayson's Eptesicus

Barrow, WA, 23590 ha		5
Bernier, WA, 4267 ha		27,5
Burrup, WA, 11804 ha		338
Dirk Hartog, WA, 58640 ha		2,3,5
Hermite, WA, 836 ha		26
North Malus, WA, 8 ha		3,216

North, Sir Ed Pellew, NT, 5778 ha		275
Trimouille, WA, 450 ha		3,5,26

EPTESICUS REGULUS, Vespertilionidae - King River Eptesicus

Phillip, VIC, 10116 ha		73
Rotamah, Lake Victoria, VIC, 340 ha		73,145
Tasmania, TAS, 6200000 ha		5,301

EPTESICUS SAGITTULA, Vespertilionidae - Large Forest Eptesicus

Rotamah, Lake Victoria, VIC, 340 ha		145

EPTESICUS TROUGHTONI, Vespertilionidae - Troughton's Eptesicus

Dunk, QLD, 650 ha		257
Lindeman, QLD, 610 ha	? species, possibly *E. pumilus*	226

EPTESICUS VULTURNUS, Vespertilionidae - Little Forest Eptesicus

Flinders, TAS, 134720 ha		301
Phillip, VIC, 10116 ha		73
Rotamah, Lake Victoria, VIC, 340 ha		73,145
Tasmania, TAS, 6200000 ha		1,5,301

FALSISTRELLUS TASMANIENSIS, Vespertilionidae - Great Pipistrelle

Tasmania, TAS, 6200000 ha		1,4,301

MINIOPTERUS AUSTRALIS, Vespertilionidae - Little Bent-winged Bat

Bribie, QLD, 17500 ha		257
Hinchinbrook, QLD, 31756 ha		215,295
Magnetic, QLD, 5212 ha		226
Rotamah, Lake Victoria, VIC, 340 ha		73

MINIOPTERUS SCHREIBERSII, Vespertilionidae - Common Bent-winged Bat

Gibbings, WA, 289 ha		41
Hidden, WA, 1974 ha		41
Hinchinbrook, QLD, 31756 ha		215,295
Phillip, VIC, 10116 ha		73
Rotamah, Lake Victoria, VIC, 340 ha		73
Sunday, WA, 1157 ha		41

MYOTIS ADVERSUS, Vespertilionidae - Large-footed Mouse-eared Bat

Groote Eylandt, NT, 225820 ha		1
Hinchinbrook, QLD, 31756 ha		215
Phillip, VIC, 10116 ha		73

NYCTOPHILUS ARNHEMENSIS, Vespertilionidae - Arnhem Land Long-eared Bat

Gibbings, WA, 289 ha		41
Groote Eylandt, NT, 225820 ha		1,18
Melville, NT, 573000 ha		284
North, Sir Ed Pellew, NT, 5778 ha		275
Sunday, WA, 1157 ha		41

NYCTOPHILUS BIFAX, Vespertilionidae - North Queensland Long-eared Bat

Hinchinbrook, QLD, 31756 ha		215
Melville, NT, 573000 ha		18
Moa, QLD, 17441 ha		302
Prince of Wales, QLD, 19646 ha		302

NYCTOPHILUS GEOFFROYI, Vespertilionidae - Lesser Long-eared Bat

Bernier, WA, 4267 ha		27
Dirk Hartog, WA, 58640 ha		2,3
Dorre, WA, 5163 ha		27
Enderby, WA, 3190 ha		216
Flinders, TAS, 134720 ha	? species	7,302
Fraser, QLD, 165400 ha	? species	10
Kangaroo, SA, 450000 ha		11
King, TAS, 110000 ha		7,301
Phillip, VIC, 10116 ha		73
Rotamah, Lake Victoria, VIC, 340 ha		73,145
Saint Peter, SA, 3731 ha		45
Tasmania, TAS, 6200000 ha		1,4,301
West Sister, TAS, 714 ha		7

NYCTOPHILUS TIMORIENSIS, Vespertilionidae - Greater Long-eared Bat

Tasmania, TAS, 6200000 ha		301,302

PIPISTRELLUS TENUIS, Vespertilionidae - Timor Pipistrelle

Groote Eylandt, NT, 225820 ha		284
Sunday, WA, 1157 ha		41

SCOTOREPENS BALSTONI, Vespertilionidae - Western Broad-nosed bat

Magnetic, QLD, 5212 ha		226

NYCTINOMUS AUSTRALIS, Molossidae - White-striped Mastiff-bat

Carnac, WA, 16 ha		315
Culeenup, WA, 51 ha		271
Garden, WA, 1054 ha		?
Jeegarnyeejip, WA, 15 ha		271
Kangaroo, SA, 450000 ha		11
Rottnest, WA, 1705 ha		?

LEPUS CAPENSIS, Leporidae - Hare

Flinders, SA, 3642 ha	now absent	113
Phillip, VIC, 10116 ha		73
Tasmania, TAS, 6200000 ha		1,4
West Sister, TAS, 714 ha		7,22

ORYCTOLAGUS CUNICULUS, Leporidae - Rabbit

#Cocos-Keeling (group), COM, 1420 ha		255
Actaeon, TAS, 13 ha	low number in 1980	198
Ballee, WA, 19 ha		271
Bennison, VIC, 5 ha		88
Big Green, TAS, 114 ha	8000 destroyed in 10 years to ?1872, now absent	7,289
Big, Five Islands, NSW, 19 ha	introduced before 1843, absent 1988	165,259
Bowen, NSW, 50 ha		159
Breaksea, WA, 102 ha		3,102, 172
Breaksea (Middle), TAS, 20 ha		56
Broughton, NSW, 138 ha	introduced 1906	157
Bruny, TAS, 36735 ha		147
Cabbage Tree, NSW, 30 ha	introduced ca 1900	164
Carnac, WA, 16 ha	introduced 1820s, 1934, poisoned 1970s, now absent	3,38
Churchill, VIC, 45 ha		87
Citadel, VIC, 20 ha	introduced 1913, absent 1978	17,87, 88,120
Clarke, TAS, 8391 ha		7,22
Culeenup, WA, 51 ha		271
Deal, TAS, 1722 ha		7,87
Doughboy, VIC, 2 ha	now absent	17,73, 87,166
Drum, VIC, 79 ha		73
East Kangaroo, TAS, 147 ha	extinct	7
Eclipse (near Albany), WA, 104 ha		51,102, 171
Elizabeth, VIC, 22 ha		87
Erith-Dover, TAS, 678 ha	present in 1865, 1872, 1890, absent 1970s	7,139, 289,290
Flinders, TAS, 134720 ha	now absent	7,141
French, VIC, 17470 ha		17,73, 87

George Rocks, TAS, 2 ha	introduced ca 1936	121, 134, 175
Goose, WA, 56 ha		3
Great Dog, TAS, 377 ha		17
Green, SA, 2 ha		45
Green Islet, North, WA, 2 ha	poisoned now absent	38,49
Green Islet, South, WA, 8 ha	poisoned now absent	49,103
Griffiths, VIC, 33 ha		184
Hareby, SA, 46 ha		45
Hunter, TAS, 7182 ha	present 1890, now absent	193
Jeegarnyeejip, WA, 15 ha		271
Jennala, WA, 15 ha		271
Kangaroo, SA, 450000 ha	introduced, failed to establish	1,11
Lady Julia Percy, VIC, 149 ha	1 pair released 1868, present 1979	89,114, 123,160
Leo, WA, 21 ha	2 prs released 1971-2, poisoned 1976, now absent	38
Little (adj. Lewis), SA, 2 ha		45
Little Yunderup, WA, 1 ha		271
Macquarie, TAS, 11800 ha		127
Maria, TAS, 10401 ha	now absent	312
Meeyip, WA, 7 ha		271
Michaelmas, WA, 93 ha		102,173
Middle (Abrolhos), WA, 19 ha	now absent	3
Middle Doubtful, WA, 58 ha	?record	3
Mistaken, WA, 10 ha	poisoned 1977, 1978, 1980, re-invaded	102,174
Montagu, NSW, 49 ha	present 1967	152,233
Morley, WA, 7 ha	introduced 1970s, poisoned 1976, now absent	38
Mud, VIC, 60 ha	"almost" eradicated 1980s	73,124, 208
North (Gambier), SA, 66 ha		45
North Bickers, SA, 6 ha	? record, skull only	45
Orpheus, QLD, 1160 ha	released ? 1987, eradication underway 1991	294
Partney, SA, 38 ha		45
Pelsaert, WA, 120 ha	established from shipwreck 1880s, now absent	260,299
Penguin, WA, 12 ha		108
Phillip, COM, 224 ha	now eradicated?	128
Phillip, VIC, 10116 ha		17,54, 73,87
Quail, VIC, 480 ha		17,87
Rabbit, QLD, 312 ha	chinchilla rabbits farmed 1930s, now absent	294
Rabbit, SA, 15 ha		45
Rabbit, VIC, 26 ha	extinct, myxomatosis, poisoned? 1968	7,54, 88,126, 182
Rabbit Rock, VIC, 1 ha	present 1912, now absent	183
Rodd, NSW, 1 ha	present before 1859, now absent	225
Rotamah, Lake Victoria, VIC, 340 ha		73,145
Saint Helens, TAS, 51 ha	introduced 1920, eradicated 1930, re-introduced 1975, now absent	176
Saint Margaret, VIC, 1934 ha		87
Sloping, TAS, 108 ha		135
Snake, VIC, 4623 ha	? present	17
South Mount Dutton, SA, 1 ha		45
South Solitary, NSW, 10 ha	? eradicated by myxoma 1975	155
Southport, TAS, 7 ha		197
Spilsby, SA, 405 ha	poisoned, ? result	45
Sterile, TAS, 4 ha	? record	199
Stickney, SA, 56 ha		45
Sunday, VIC, 1034 ha	now absent?, ref. 125 says present	17,73
Swan, VIC, 247 ha		73
Tasmania, TAS, 6200000 ha		1,4
Three Hummock, TAS, 7110 ha	1 in 1908, now absent	193
Tollgate, NSW, 5 ha	eradicated with 1080, 1987	259
Tumby, SA, 26 ha		45
Venus Bay, island B S, SA, 6 ha		45
Venus Bay, island C E, SA, 13 ha		45
Wardang, SA, 1756 ha		45,248
West, SA, 14 ha	poisoned 1972-3, now absent	45,168
Wooded, WA, 14 ha	introduced from Leo Is., poisoned 1976, now absent	38
Woody, QLD, 563 ha		294
Worallgarook, WA, 8 ha		271
Wright, SA, 2 ha	now absent	169
Yangie Bay, SA, 6 ha		45
Yunderup, WA, 8 ha		271

CONILURUS PENICILLATUS, Muridae - Brush-tailed Rabbit-rat

Bathurst, NT, 164520 ha		1,18
Bentinck, QLD, 13800 ha		21
Centre, Sir Ed Pellew, NT, 9222 ha		13,21, 275
Groote Eylandt, NT, 225820 ha		1,18,12, 21
Melville, NT, 573000 ha		1,18,21

HYDROMYS CHRYSOGASTER, Muridae - Water Rat

Alpha, WA, 86 ha		217
Barrow, WA, 23590 ha		3,21,25
Bathurst, NT, 164520 ha		1,21
Boomerang, WA, 5 ha		218
Breaksea (Middle), TAS, 20 ha		56
Bribie, QLD, 17500 ha		10
Burrup, WA, 11804 ha		338
Carnac, WA, 16 ha	? record	286
Cat, TAS, 41 ha		22
Centre, Sir Ed Pellew, NT, 9222 ha		13,275
Culeenup, WA, 51 ha		271
Dent, QLD, 338 ha		257
Depuch, WA, 1121 ha		3,37
Dorre, WA, 5163 ha		101
Dunk, QLD, 650 ha		257
Fisher, TAS, 1 ha		167
Flinders, TAS, 134720 ha		7,22, 301
Fraser, QLD, 165400 ha		10,21
French, VIC, 17470 ha		53,73
Groote Eylandt, NT, 225820 ha		1,12,18, 21
Haslewood, QLD, 720 ha		294
Henning, QLD, 38 ha		294
Hermite, WA, 836 ha		26
Hinchinbrook, QLD, 31756 ha		215,295
Hunter, TAS, 7182 ha		301
Kingfisher (=N Wood), WA, 1017 ha		16
Lion, NSW, 8 ha		154
Long, QLD, 987 ha		294
Magnetic, QLD, 5212 ha		32,21
Maria, TAS, 10401 ha	? record, no specimen?	59,301, 312

Melville, NT, 573000 ha		1,18,21
Moreton, QLD, 17021 ha		10,257
North Gidley, WA, 259 ha		216
North Molle, QLD, 219 ha		294
North Stradbroke, QLD, 26344 ha		10,15, 257
North, Sir Ed Pellew, NT, 5778 ha		275
Phillip, VIC, 10116 ha		53,73
Prime Seal, TAS, 1219 ha		22,301
Rosemary, WA, 1152 ha		216
Sir Graham Moore, WA, 2774 ha		16
South Molle, QLD, 380 ha		294
South West, Pellew, NT, 9517 ha		13,275
Tasmania, TAS, 6200000 ha		1,301
Three Hummock, TAS, 7110 ha		7,301
Trimouille, WA, 450 ha		26
Vanderlin, NT, 27690 ha		275
West Sister, TAS, 714 ha		22,301
Whitsunday, QLD, 10526 ha		294

LEGGADINA AFF. *LAKEDOWNENSIS*, Muridae - Thevenard Island Mouse

Thevenard, WA, 708 ha	earlier refs refer to *L. forresti*	1,3,32, 21

LEPORILLUS CONDITOR, Muridae - Greater Stick-nest Rat

Franklin, SA, 512 ha		11,45, 107, 244,245
Reevesby, SA, 373 ha	introduced/ re-introduced 1990	283
Salutation, WA, 162 ha	40 introduced July 1990	300

MASTACOMYS FUSCUS, Muridae - Broad-toothed Rat

Swan, VIC, 247 ha	single record, now absent	7,73
Tasmania, TAS, 6200000 ha		1,4,21, 301

MELOMYS BURTONI, Muridae - Grassland Melomys

Bathurst, NT, 164520 ha		18,21
Bribie, QLD, 17500 ha		10
Centre, Sir Ed Pellew, NT, 9222 ha		275
Elcho, NT, 26950 ha		18
Fraser, QLD, 165400 ha		21
Groote Eylandt, NT, 225820 ha		1,18,21
Hinchinbrook, QLD, 31756 ha		215,295
Lachlan, WA, 1296 ha		41
Maer (= Mer, Murray Is), QLD, 390 ha	(holotype *Uromys murinus* Thomas)	294
Marchinbar, NT, 21190 ha		276,278
Melomys (=M Wood), WA, 678 ha	?species	16
Melville, NT, 573000 ha		18,21
North Stradbroke, QLD, 26344 ha		10,21
North, Sir Ed Pellew, NT, 5778 ha		275
Sir Graham Moore, WA, 2774 ha	? species	3,16
Skull, NT, 635 ha		275
South Peron, NT, 485 ha		276,278
South West, Pellew, NT, 9517 ha		275
Sunday, WA, 1157 ha		41
Vanderlin, NT, 27690 ha		275
West, Sir Ed Pellew, NT, 13373 ha		275

MELOMYS CERVINIPES, Muridae - Fawn-footed Melomys

Carlisle, QLD, 550 ha		81,257
Dunk, QLD, 650 ha		257
Fraser, QLD, 165400 ha		10
Gloucester, QLD, 2484 ha		294
Haslewood, QLD, 720 ha		294
Hayman, QLD, 321 ha	(holotype *M. limicauda*)	294
Hinchinbrook, QLD, 31756 ha		215,295
Hook, QLD, 6161 ha		294
North Molle, QLD, 219 ha		294
North Stradbroke, QLD, 26344 ha		10,15, 21,25
Whitsunday, QLD, 10526 ha		294

MELOMYS RUBICOLA, Muridae

Bramble Cay, QLD, 7 ha		112

MESEMBRIOMYS GOULDII, Muridae - Black-footed Tree-rat

Bathurst, NT, 164520 ha		1,18,21
Melville, NT, 573000 ha		1,18,21

MESEMBRIOMYS MACRURUS, Muridae - Golden-backed Tree-rat

Carlia, WA, 450 ha		3,16
Conilurus (=Margaret), WA, 329 ha		3,41
Hidden, WA, 1974 ha		41
Uwins, WA, 3240 ha		3,16
Wollaston, WA, 798 ha		3,16

MUS MUSCULUS, Muridae - House Mouse

#Cocos-Keeling (group), COM, 1420 ha		255
Althorpe, SA, 81 ha		45
Babel, TAS, 430 ha		22
Badger, TAS, 1235 ha		22
Baird, SA, 18 ha		45
Barrow, WA, 23590 ha	warehouse only, eradicated	3
Boullanger, WA, 34 ha		3,35
Bribie, QLD, 17500 ha		10
Browse, WA, 12 ha		3,16
Burrup, WA, 11804 ha		338
Cape Barren, TAS, 46220 ha		22
Carnac, WA, 16 ha		3,315
Clonmel, VIC, 140 ha		296
Culeenup, WA, 51 ha		271
Dirk Hartog, WA, 58640 ha		3,2
Dixon, WA, 495 ha		3
Dog, VIC, 140 ha		73
East Kangaroo, TAS, 147 ha		22
East Sister, TAS, 519 ha		22
Faure, WA, 5148 ha		262
Figure of Eight, WA, 248 ha		39
Flinders, TAS, 134720 ha		7,21,22, 141
French, VIC, 17470 ha		17,73
Goose, SA, 6 ha		248
Great Dog, TAS, 377 ha		22,210
Hermite, WA, 836 ha		217
Hummock, VIC, 313 ha		73
Jeegarnyeejip, WA, 15 ha		271
Kangaroo, SA, 450000 ha		1,11
King, TAS, 110000 ha	present in 1887	7,21, 140,142
Lion, NSW, 8 ha		154
Little Dog, TAS, 65 ha		22,211
Little Goose, SA, 2 ha		248
Lord Howe, NSW, 1455 ha		130
Macquarie, TAS, 11800 ha		127
Maria, TAS, 10401 ha		59,312
Meeyip, WA, 7 ha		271
Montagu, NSW, 49 ha		152
Moreton, QLD, 17021 ha		257
Mount Chappell, TAS, 349 ha		205
Mungary (Island Pt), SA, 3 ha		248
Mutton Bird, NSW, 8 ha		163
North (Abrolhos), WA, 176 ha	introduced 1970s	288
North Bickers, SA, 6 ha		45
North Stradbroke, QLD, 26344 ha		10
Penguin, WA, 12 ha	introduced ca 1920s	108,212
Phillip, VIC, 10116 ha		17,73
Prime Seal, TAS, 1219 ha		22
Quail, VIC, 480 ha		73

Rat, WA, 56 ha	present many years before 1987	287
Reevesby, SA, 373 ha		45
Rotamah, Lake Victoria, VIC, 340 ha		73,145
Rottnest, WA, 1705 ha		3,162
Saint Margaret, VIC, 1934 ha		73
Saint Peter, SA, 3731 ha		45
Snake, VIC, 4623 ha		73
Southport, TAS, 7 ha		197
Sugarloaf Rock, WA, 1 ha		3
Tasmania, TAS, 6200000 ha		1,4,21
Thevenard, WA, 708 ha	introduced 1986	3
Three Bays, WA, 5 ha		227
Trefoil, TAS, 140 ha		201
Venus Bay, island A N, SA, 17 ha		45
Wardang, SA, 1756 ha		248
Whitlock, WA, 5 ha		35
Yunderup, WA, 8 ha		271
NOTOMYS AQUILO, Muridae - Northern Hopping-mouse		
Groote Eylandt, NT, 225820 ha		1,12,18, 21
PSEUDOMYS ALBOCINEREUS, Muridae - Ash-grey Mouse		
Bernier, WA, 4267 ha		1,3,27, 21
Dirk Hartog, WA, 58640 ha		2,3
Dorre, WA, 5163 ha		3,27,21
Woody, WA, 108 ha	? species, no specimen, no found in 1992	33,21, 319
PSEUDOMYS DELICATULUS, Muridae - Delicate Mouse		
Bigge, WA, 17850 ha		3,1
Burrup, WA, 11804 ha		338
Fraser, QLD, 165400 ha		10
Groote Eylandt, NT, 225820 ha		1,12,18 21
North, Sir Ed Pellew, NT, 5778 ha		275
Vanderlin, NT, 27690 ha		275
West, Sir Ed Pellew, NT, 13373 ha		13,21, 275
PSEUDOMYS DESERTOR, Muridae - Desert Mouse		
Bernier, WA, 4267 ha	? no recent records	27
Fraser, QLD, 165400 ha	? record, not in reference 21	10
PSEUDOMYS FIELDI, Muridae - Shark Bay Mouse		
Bernier, WA, 4267 ha		1,3,27, 40,21
PSEUDOMYS HERMANNSBURGENSIS, Muridae - Sandy inland Mouse		
Burrup, WA, 11804 ha		338
Dirk Hartog, WA, 58640 ha		2,3,
Dixon, WA, 495 ha		2,3
Rosemary, WA, 1152 ha		28
PSEUDOMYS HIGGINSI, Muridae - Long-tailed Mouse		
Tasmania, TAS, 6200000 ha		1,4,21, 301
PSEUDOMYS NANUS, Muridae - Western Chestnut Mouse		
Barrow, WA, 23590 ha		1,3,25, 21
South West, Pellew, NT, 9517 ha		1,13,21, 275
PSEUDOMYS NOVAEHOLLANDIAE, Muridae - New Holland Mouse		
Flinders, TAS, 134720 ha		293,301
Hummock, VIC, 313 ha		73
Tasmania, TAS, 6200000 ha		1,21, 293,301
RATTUS EXULANS, Muridae - Polynesian Rat		
Adele, WA, 247 ha	introduced, ?Indonesian fishermen	20,21
Christmas, COM, 13470 ha	recorded 1933	261
Maer (=Mer, Murray Is), QLD, 390 ha		20,21
Sunday, WA, 1157 ha		41
RATTUS FUSCIPES, Muridae - Southern Bush Rat		
Bald, WA, 720 ha		3
Big, Smith's Lake, NSW, 22 ha		257
Charley, WA, 101 ha		203
Chatham, WA, 69 ha		3,75
Cribb, QLD, 80 ha		20,257
Daw, WA, 212 ha		3
Dog, SA, 37 ha		44,45
East Wallabi, WA, 307 ha		3,20,48
Eyre, SA, 984 ha		45
Fraser, QLD, 165400 ha		10,20
French, VIC, 17470 ha		17,53, 73
Goat, SA, 285 ha		3,20,44, 45,244
Great Glennie, VIC, 119 ha		7,54,73
Greenly, SA, 141 ha		20,44, 45,21, 249
Hinchinbrook, QLD, 31756 ha		20,215, 295
Hood, WA, 96 ha		110,193
Hopkins, SA, 112 ha		45
Kangaroo, SA, 450000 ha		1,11,20, 21
Lacy, SA, 113 ha		45
Liguanea, SA, 129 ha		45
Masillon, SA, 202 ha		45
Michaelmas, WA, 93 ha		3,173
Mondrain, WA, 810 ha		3,20, 187
North (Gambier), SA, 66 ha		44,45
North Neptune, West I, SA, 170 ha		45
North Twin Peak, WA, 272 ha		3
Pearson, north, SA, 164 ha		3,19,20, 44,45, 21,250
Perforated, SA, 58 ha		45
Salisbury, WA, 368 ha		3
Snake, VIC, 4623 ha		50,58
Waldegrave, SA, 335 ha		44,45
West Wallabi, WA, 587 ha		20,48
Williams, SA, 158 ha		44
Woody, WA, 108 ha	extinct	20,33
RATTUS LUTREOLUS, Muridae - Swamp Rat		
Bribie, QLD, 17500 ha		10,20
Bruny, TAS, 36735 ha		301
Cape Barren, TAS, 46220 ha		7,22, 301
De Witt, TAS, 518 ha		56,180, 301
Flinders, TAS, 134720 ha		7,20,22, 301
Fraser, QLD, 165400 ha		10,20
French, VIC, 17470 ha		17,53, 73
Hindmarsh, SA, 5860 ha		20
Hogan, TAS, 239 ha		7,20, 133
Hummock, VIC, 313 ha		73
Kangaroo, SA, 450000 ha		1,11, 20,21
King, TAS, 110000 ha		7,20, 301
Louisa, TAS, 21 ha	? species, joined to Tasmania by tombolo	56,179

Maria, TAS, 10401 ha		20,301, 312
North Stradbroke, QLD, 26344 ha		10,20, 15
Rotamah, Lake Victoria, VIC, 340 ha		73,145
Snake, VIC, 4623 ha		73
Tasmania, TAS, 6200000 ha		1,4,20, 21,301

RATTUS MACLEARI, Muridae - Christmas Island Rat

Christmas, COM, 13470 ha	extinct 1908	254

RATTUS NATIVITATIS, Muridae - Christmas Island Rat

Christmas, COM, 13470 ha	extinct 1908	254

RATTUS NORVEGICUS, Muridae - Brown Rat

Griffiths, VIC, 33 ha		184
Mutton Bird, NSW, 8 ha		163
Snapper, NSW, 1 ha	present 1930s, ? species	225
Tasmania, TAS, 6200000 ha		1,4,21

RATTUS RATTUS, Muridae - Black Rat

#Cocos-Keeling (group), COM, 1420 ha	introduced 1878, ex shipwreck	255,263
Alpha, WA, 86 ha	? shipwreck	26
Barrow, WA, 23590 ha	introduced, first recorded 1990, poisoned 1991, not located 1993	264,165
Bathurst, NT, 164520 ha		1,21
Bedout, WA, 24 ha	poisoned 1981, now absent	3
Big Green, TAS, 114 ha		7,22, 54,95
Bluebell, WA, 53 ha	? shipwreck	26
Boodie, WA, 170 ha	eradicated by poison 1985	9,61
Boomerang, WA, 5 ha	eradicated by poison 1983	61
Bowen, NSW, 50 ha	? species	159
Boxer, WA, 166 ha		39
Boydong, QLD, 16 ha	extensive population, June 1990	317
Broughton, NSW, 138 ha	? species	157
Brush, NSW, 35 ha	? record, dead specimen in July 1974	153
Burrup, WA, 11804 ha		338
Campbell, WA, 40 ha	? shipwreck	26
Cape Barren, TAS, 46220 ha		22
Christmas, COM, 13470 ha	introduced 1898-1908	254, 261,263
Coringa Cay, Southwest, COM, 13 ha		231
Culeenup, WA, 51 ha		271
Deal, TAS, 1722 ha		7,143
Dog, VIC, 140 ha		73
Doughboy, VIC, 2 ha		166
Fairfax, QLD, 21 ha	? species	239
Fisher, TAS, 1 ha	introduced 1971, eradicated 1974	167
Flinders, SA, 3642 ha	? absent, ref. 247 says present	45,244, 247
Flinders, TAS, 134720 ha		7,22, 141
George Rocks, TAS, 2 ha		121, 134,175
Gidley, WA, 798 ha		3
Great Dog, TAS, 377 ha		22,210
Great Glennie, VIC, 119 ha		73
Green (near Cairns), QLD, 15 ha		317
Griffiths, VIC, 33 ha		184
Groote Eylandt, NT, 225820 ha		1,21
Hermite, WA, 836 ha	? shipwreck	3,26
Heron, QLD, 13 ha	? species, eradicated 1964-5, now absent	156,238
Howick, QLD, 446 ha		317
Kangaroo, SA, 450000 ha		1,11,21
King, TAS, 110000 ha		7,142
Lindeman, QLD, 610 ha	resort	294
Lion, NSW, 8 ha	? species, ? absent since 1968	154
Little Boydong, QLD, 3 ha	? species	317
Little Broughton, NSW, 36 ha	? species	158
Little Dog, TAS, 65 ha		211
Long, QLD, 987 ha	resort	294
Long, WA, 1356 ha	? species	41
Lord Howe, NSW, 1455 ha	from shipwreck, 1919	130
Macquarie, TAS, 11800 ha	introduced 1880-1908	127,263
Maria, TAS, 10401 ha		59,312
Melville, NT, 573000 ha		1,21
Middle (near Barrow), WA, 350 ha		3
Middle Lacepede, WA, 42 ha	poisoned 1986, now absent	3
Mistaken, WA, 10 ha		38
Mount Chappell, TAS, 349 ha		205
Newry, QLD, 51 ha	resort	294
Norfolk, COM, 3450 ha	introduced pre-1971	28,263
North Double, WA, 12 ha	eradicated by poison 1983	3,61
North Stradbroke, QLD, 26344 ha		10
Northwest, WA, 106 ha	? shipwreck	26
Pasco, WA, 2 ha	poisoned 1985, now absent	61
Phillip, VIC, 10116 ha		73
Pigeon, WA, 3 ha	poisoned, now absent	3
Primrose, WA, 35 ha	? shipwreck	26
Rat, WA, 56 ha	present 1840, poisoned 1991	3 3
Rocky, QLD, 38 ha	present since at least 1930	204
Rotamah, Lake Victoria, VIC, 340 ha		73,145
Rottnest, WA, 1705 ha	? species	3
Saint Francis, SA, 809 ha	extinct, subfossil only	45,244
Sandy (Lacepede Is), WA, 6 ha	poisoned 1986, now absent	43
South Double, WA, 23 ha	eradicated by poison 1983	3,61
South East (Montbello), WA, 13 ha	? shipwreck	26
South Molle, QLD, 380 ha	single skull found	294
Sunday, WA, 1157 ha		41
Tasmania, TAS, 6200000 ha		1,4,20, 21
Trimouille, WA, 450 ha	? shipwreck	3,26
West Lacepede, WA, 82 ha	poisoned 1986, now absent	3
Woody, WA, 108 ha	present 1950, 1992	33, 188,319
Wreck, QLD, 4 ha	? species	213, 230,239

RATTUS SORDIDUS, Muridae - Canefield Rat

Albany, QLD, 616 ha		20,21
Moreton, QLD, 17021 ha		20,21, 257
Moreton, QLD, 17021 ha		294
North Stradbroke, QLD, 26344 ha		20
South West, Pellew, NT, 9517 ha		275

RATTUS TUNNEYI, Muridae - Pale Field-rat

Angel, WA, 927 ha		216
Bathurst, NT, 164520 ha		1
Boongaree, WA, 4935 ha		3,16
Centre, Sir Ed Pellew, NT, 9222 ha		275
Dolphin, WA, 3281 ha		3,216
East Lewis, WA, 1018 ha		216
Enderby, WA, 3190 ha		216
Fraser, QLD, 165400 ha		10,20, 21
Gidley, WA, 798 ha	? species	216
Groote Eylandt, NT, 225820 ha		1,21
Hauy, WA, 110 ha		3,216
Keast, WA, 40 ha		3,216
Legendre, WA, 1286 ha		3,20
Malus, WA, 170 ha		216
Melville, NT, 573000 ha		18,20, 21
Middle Mangrove, WA, 113 ha		3,20
Moreton, QLD, 17021 ha		10,20, 257
Mornington, QLD, 97020 ha		1
North Malus, WA, 8 ha	connects to Malus Is. at low water	3,216
North Stradbroke, QLD, 26344 ha		10,20, 21
North, Sir Ed Pellew, NT, 5778 ha		275,276
Saint Andrew, WA, 1525 ha		3,16
South West, Pellew, NT, 9517 ha		275
Vanderlin, NT, 27690 ha		275
Weld, WA, 39 ha		3
West Lewis, WA, 1974 ha		3,20,28
West, Sir Ed Pellew, NT, 13373 ha		275

RATTUS VILLOSISSIMUS, Muridae - Long-haired Rat

Black (Craggy), NT, 431 ha	275
Moreton, QLD, 17021 ha	20
North, Sir Ed Pellew, NT, 5778 ha	275
Skull, NT, 635 ha	275
South West, Pellew, NT, 9517 ha	20,13, 21,275
Watson, NT, 1322 ha	275

RATTUS SP., Muridae

Truant, NT, 269 ha	282

UROMYS CAUDIMACULATUS, Muridae - White-tailed Rat

Dunk, QLD, 650 ha		77
Hinchinbrook, QLD, 31756 ha		1,21, 215,295
North East Percy, QLD, 217 ha	? species	79

XEROMYS MYOIDES, Muridae - False Water-rat

Bribie, QLD, 17500 ha	257
Melville, NT, 573000 ha	21,30
North Stradbroke, QLD, 26344 ha	1,29

ZYZOMYS ARGURUS, Muridae - Common Rock-rat

Augustus, WA, 19023 ha	16
Barrow, WA, 23590 ha	3,21,25
Black (Craggy), NT, 431 ha	275
Burrup, WA, 11804 ha	338
Centre, Sir Ed Pellew, NT, 9222 ha	275
Dolphin, WA, 3281 ha	28
Elcho, NT, 26950 ha	276,278
Enderby, WA, 3190 ha	3,216
Groote Eylandt, NT, 225820 ha	1,12, 18,21
Kendrew, WA, 6 ha	3,216
Legendre, WA, 1286 ha	3,28
Marchinbar, NT, 21190 ha	276
North Coronation, WA, 4038 ha	3,16
North, Sir Ed Pellew, NT, 5778 ha	275
Rosemary, WA, 1152 ha	3,28
South West, Pellew, NT, 9517 ha	275
Vanderlin, NT, 27690 ha	275
West, Sir Ed Pellew, NT, 13373 ha	275

ZYZOMYS WOODWARDI, Muridae - Large Rock-rat

Augustus, WA, 19023 ha		3,16
Bathurst, WA, 610 ha		3,44
Bigge, WA, 17850 ha		3,16
Boongaree, WA, 4935 ha		3,16
Borda, WA, 728 ha		3,16
Champagny, WA, 1456 ha	? species	16
Darcy (=North Heywood), WA, 4945 ha		3,16
Irvine, WA, 967 ha		3,4
Katers, WA, 1775 ha		3,16
Middle Osborne, WA, 2252 ha		3,16
South Heywood, WA, 768 ha	?species	16
South West Osborne, WA, 1326 ha		3,16

CANIS FAMILIARIS, Canidae - Dingo, Dog

#Cocos-Keeling (group), COM, 1420 ha	dogs	255
Anderson, TAS, 148 ha	wild dogs, present 1830, now absent	7,291
Augustus, WA, 19023 ha		16
Bigge, WA, 17850 ha		16
Breaksea, WA, 102 ha	pet dog ca 1900, now absent	172
Bremer, NT, 1374 ha	domestic dogs	282
Bribie, QLD, 17500 ha		10
Bruny, TAS, 36735 ha	domestic dogs, present 1829 with Aborigines	147,291
Burrup, WA, 11804 ha	domestic dogs	284
Cape Barren, TAS, 46220 ha	present 1831, ?pet, 1874	289,291
Centre, Sir Ed Pellew, NT, 9222 ha		275
Clarke, TAS, 8391 ha	present 1830	291
Croker, NT, 31000 ha	domestic dogs	282
Curtis, QLD, 56345 ha		294
Deal, TAS, 1722 ha	? pet	290
Elcho, NT, 26950 ha	domestic dogs	282
Flinders, QLD, 1480 ha		63
Flinders, TAS, 134720 ha	wild dogs, 'kangaroo dogs' present 1872	7,289
Fraser, QLD, 165400 ha	dingoes, not dogs	10,237
Great Dog, TAS, 377 ha	wild dogs, plentiful 1830	7,22, 291
Groote Eylandt, NT, 225820 ha		278
Heron, QLD, 13 ha	dogs, now absent	213
Hinchinbrook, QLD, 31756 ha	dingo	215,295
Hunter, TAS, 7182 ha	present 1830 (sealers), 10 kangaroo dogs in 1851	193,291
Kangaroo, SA, 450000 ha	wild dogs	11
King, TAS, 110000 ha	wild dogs, present in 1887	64,140
Lady Elliott, QLD, 37 ha	dog, one (pet?), removed 1969	213
Little Dog, TAS, 65 ha	wild dogs, 'several' in 1831	7,291
Lizard, QLD, 850 ha	2 in 1880	303
Lord Howe, NSW, 1455 ha	wild dogs	130
Marchinbar, NT, 21190 ha		276
Maria, TAS, 10401 ha	dogs, present 1884	292
Melville, NT, 573000 ha		63
Middle Osborne, WA, 2252 ha		16
Milingimbi, NT, 5236 ha	domestic dogs	282
Mornington, QLD, 97020 ha		67
Mutton Bird, NSW, 8 ha	wild dogs, natural spread	163

Rabama (=Yabooma?), NT, 2653 ha	dingoes & domestic dogs	151
Rotamah, Lake Victoria, VIC, 340 ha	wild dogs	145
Saint Francis, SA, 809 ha	dog, 1922	252
Sims, NT, 42 ha		63
South Solitary, NSW, 10 ha	? now absent	155
South West, Pellew, NT, 9517 ha		13,275
Sunday, VIC, 1034 ha	wild dogs	17
Swan, TAS, 247 ha	wild dogs, 30 in 1830	7,291
Tasmania, TAS, 6200000 ha	wild dogs	4,7
Three Hummock, TAS, 7110 ha	wild dogs, present 1830	7,291
Vanderlin, NT, 27690 ha		13,275
Vansittart, TAS, 765 ha	wild dogs, 40 in 1840, ? now absent	7,291
Walker, TAS, 634 ha	sealers' dogs, 1830	291
Whitsunday, QLD, 10526 ha	wild dogs present 1930s, 1974, now absent	294
Wigram, NT, 2061 ha	domestic dogs, one dingo introduced	282
Wollaston, WA, 798 ha		16

VULPES VULPES, Canidae - Red Fox

Angel, WA, 927 ha	natural spread	28
Ballee, WA, 19 ha		271
Bennison, VIC, 5 ha	natural spread	17,96
Bird, East, SA, 1 ha	natural spread	45
Burrup, WA, 11804 ha		338
Culeenup, WA, 51 ha		271
Depuch, WA, 1121 ha	natural spread	36
Dolphin, WA, 3281 ha	natural spread	28,216
East Intercourse, WA, 300 ha	causeway to mainland 1968	216
Eba, SA, 91 ha	natural spread	45
Germein, SA, 173 ha	natural spread	45
Gidley, WA, 798 ha	natural spread	28
Great Dog, TAS, 377 ha		7,54
Griffiths, VIC, 33 ha	natural spread, ? absent 1965	184
Jeegarnyeejip, WA, 15 ha		271
Jennala, WA, 15 ha		271
Legendre, WA, 1286 ha	natural spread	3,28
Little Yunderup, WA, 1 ha		271
Meeyip, WA, 7 ha		271
Mutton Bird, NSW, 8 ha	natural spread, one shot 1975	163
North Gidley, WA, 259 ha	natural spread	81
Phillip, VIC, 10116 ha	natural spread	17,54 73,96
Quail, VIC, 480 ha		17
Rotamah, Lake Victoria, VIC, 340 ha	causeway to mainland	145
Saint Margaret, VIC, 1934 ha		73
Slope, WA, 1 ha	causeway to mainland	103
Snake, VIC, 4623 ha		17
Sunday, VIC, 1034 ha	natural spread	17
Wedge, WA, 2 ha	natural spread via tombolo	103
Worallgarook, WA, 8 ha		271
Yunderup, WA, 8 ha		271

FELIS CATUS, Felidae - Feral Cat

#Cocos-Keeling (group), COM, 1420 ha		255
Althorpe, SA, 81 ha		114
Anderson, TAS, 148 ha	present 1830	291
Angel, WA, 927 ha	natural spread	28
Babel, TAS, 430 ha		22,200
Bernier, WA, 4267 ha	? pet, now absent	27
Bribie, QLD, 17500 ha		10
Broughton, NSW, 138 ha		157
Bruny, TAS, 36735 ha		147
Burrup, WA, 11804 ha		338
Cape Barren, TAS, 46220 ha		22
Christmas, COM, 13470 ha		254
Clarke, TAS, 8391 ha		22
Croker, NT, 31000 ha		282
Culeenup, WA, 51 ha		271
Curtis, QLD, 56345 ha		294
Deal, TAS, 1722 ha	present in 1890	7,139, 143
Deliverance, QLD, 36 ha	present ca 1888, still present 1928	303
Dirk Hartog, WA, 58640 ha		3,2
Dolphin, WA, 3281 ha	natural spread	216
East Intercourse, WA, 300 ha	causeway to mainalnd 1963	216
East Sister, TAS, 519 ha		22
Elcho, NT, 26950 ha		282
Faure, WA, 5148 ha		262
Flinders, SA, 3642 ha		113,247
Flinders, TAS, 134720 ha	present 1872	7,22, 141,289
Fraser, QLD, 165400 ha		10
French, VIC, 17470 ha		17,73
Gabo, VIC, 150 ha	1972	233
Garden, WA, 1054 ha		66
Gidley, WA, 798 ha	natural spread	28
Great Dog, TAS, 377 ha		22,210
Hermite, WA, 836 ha	? shipwreck	26
Heron, QLD, 13 ha	now absent	156,238
Jeegarnyeejip, WA, 15 ha		271
Kangaroo, SA, 450000 ha		1,11
King, TAS, 110000 ha	present in 1887	7,140, 142
Legendre, WA, 1286 ha	natural spread	28
Little Dog, TAS, 65 ha		22,211
Little Green, TAS, 92 ha		22,209
Lord Howe, NSW, 1455 ha		130
Macquarie, TAS, 11800 ha	introduced 1810-20	127
Magnetic, QLD, 5212 ha		294
Maria, TAS, 10401 ha		59,312
Milingimbi, NT, 5236 ha		282
Moreton, QLD, 17021 ha		10
Mount Chappell, TAS, 349 ha		22
Mutton Bird, NSW, 8 ha	natural spread	163
Ninth, TAS, 20 ha		7
North Reef, QLD, 2 ha		213
North Stradbroke, QLD, 26344 ha		10
Northwest, QLD, 108 ha	present 1925, eradicated 1986	230, 241,267
Phillip, VIC, 10116 ha		17,54
Prime Seal, TAS, 1219 ha		22
Rabama (=Yabooma?), NT, 2653 ha	? may not be feral	151
Rat, WA, 56 ha	introduced ca 1900 ?	103
Reevesby, SA, 373 ha	eradicated 1990	45
Rocky, QLD, 38 ha	now absent	67,204
Rosemary, WA, 1152 ha	single animal introduced July 1989	216
Rotamah, Lake Victoria, VIC, 340 ha	causeway to mainland	145
Rottnest, WA, 1705 ha	numbers controlled for many years	3
Saint Francis, SA, 809 ha	present 1922, now absent ?	19,244, 252
Saint Helens, TAS, 51 ha	introduced 1920s, absent by 1930s	176
Serrurier (=Long), WA, 274 ha	single animal introduced 1987	219
South Molle, QLD, 380 ha	eradication attempted, not successful	294
Sunday, VIC, 1034 ha		17
Swan, TAS, 210 ha	? pet	290
Tasman, TAS, 120 ha		177,290

Tasmania, TAS, 6200000 ha		1,4
The Brothers, SA, 1 ha	? one present, ? date	202
Thevenard, WA, 708 ha	single animal 196?-1972	222
Three Hummock, TAS, 7110 ha		7
Trimouille, WA, 450 ha	? shipwreck	26
Troubridge, SA, 9 ha	single animal, removed	45
Vanderlin, NT, 27690 ha		13,275
Wardang, SA, 1756 ha		45
ARCTOCEPHALUS FORSTERI, Otariidae - New Zealand Fur-seal		
Althorpe, SA, 81 ha		100
Beaumont, WA, 32 ha		280
Cape Barren, TAS, 46220 ha		100
Casuarina, South, SA, 9 ha		100,105
Cooper, WA, 50 ha		280
Cranny, WA, 25 ha		280
Daw, WA, 212 ha		52,280
East Doubtful, WA, 13 ha		106,280
Eclipse (near Albany), WA, 104 ha		50,100, 171,280
Fenelon, SA, 81 ha		105
Finger, WA, 8 ha		280
Hauloff Rock, WA, 25 ha		280,
Hood, WA, 96 ha		106, 193, 280, 285
Kangaroo, SA, 450000 ha		11,100, 105
Libke (nr MacKenzie), WA, 24 ha		280
Maatsuyker, TAS, 176 ha		273
Macquarie, TAS, 11800 ha		100
Middle Doubtful, WA, 58 ha		50,106
New Year, WA, 19 ha		280
Rocky, WA, 30 ha		280
Rocky (S of Greenly), SA, 13 ha		105
Salisbury, WA, 368 ha		34,50, 280
Seal Rock, WA, 5 ha		50,106, 280,285
Six Mile (Pt Dempster), WA, 10 ha	?breeding	206
South Neptune, North I, SA, 51 ha		100,118
West, WA, 30 ha		280
ARCTOCEPHALUS PUSILLUS, Otariidae - Australian Fur-seal		
Albatross, TAS, 24 ha		100
George Rocks, TAS, 2 ha		100
Hippolyte, TAS, 5 ha	? breeding	195
Judgement Rocks, TAS, 2 ha		100,138
Kanowna, VIC, 32 ha		100
Lady Julia Percy, VIC, 149 ha		100,160
Maria, TAS, 10401 ha		100
Montagu, NSW, 49 ha		100, 152,233
Moriarty Rocks, TAS, 3 ha		138
New Year, TAS, 85 ha	? species, 4300 taken in 1802	289
Pedra Branca, TAS, 3 ha		178
Reid Rocks, TAS, 9 ha		100,138
Seal, VIC, 18 ha		100
Seal Rocks, NSW, 1 ha		100
Seal Rocks, VIC, 1 ha		100
Tenth, TAS, 1 ha		100,138
The Needles, TAS, 6 ha		138
The Skerries, VIC, 1 ha		100
The Thumbs, TAS, 1 ha		196
West Moncoeur, TAS, 14 ha		138
MIROUNGA LEONINA, Phocidae - Southern Elephant Seal		
#New Year (group), TAS	extinct	100
Heard, COM, 37500 ha		131
King, TAS, 110000 ha	600 in 1802, extinct	100,290
Macquarie, TAS, 11800 ha		100
NEOPHOCA CINEREA, Phocidae - Australian Sea-lion		
Albatross, SA, 7 ha		105
Beaumont, WA, 32 ha	3 pups 4-5 months old, February 91	281
Broughton (=Passage), WA, 16 ha	1 pup 4-5 months old, February 1991	281
Buller, WA, 1 ha		49
Dangerous Reef, SA, 2 ha		100, 105,170
Daw, WA, 212 ha		34,50, 100
Dog, SA, 37 ha		100
Douglas, WA, 30 ha		100
Draper, WA, 15 ha	3 pups 4-5 months old, February 1991	281
East Beagle, WA, 2 ha		49
Eclipse (near Albany), WA, 104 ha		138
English, SA, 4 ha		100,105
Fenelon, SA, 81 ha		105
Flinders, SA, 3642 ha		100
Franklin, SA, 512 ha		100, 105,245
Freeling, SA, 8 ha		105
Glennie, WA, 40 ha		100
Greenly, SA, 141 ha		100,249
Kangaroo, SA, 450000 ha		1,11, 100
Kermadec (= Wedge), WA, 24 ha		50,100
Lewis, SA, 11 ha		100
Lion, WA, 11 ha		100
Lounds, SA, 7 ha		105
MacKenzie (= Round), WA, 48 ha		192
Middle Doubtful, WA, 58 ha		50
Nook, WA, 30 ha	2 pups 4-5 months old, February 1991	281
North (Gambier), SA, 66 ha		100,105
North Fisherman, WA, 1 ha		49,50
Olive, SA, 16 ha		105
Pasley, WA, 54 ha	pups 4-5 months old, February 1991	281
Pearson, north, SA, 39 ha		100
Purdie, SA, 14 ha		105
Rottnest, WA, 1705 ha	colony extinct	50
Round (not MacKenzie), WA, 32 ha		100
Saint Francis, SA, 809 ha		100,105
Salisbury, WA, 368 ha		34
Sandland, WA, 1 ha		100
Six Mile (Pt Dempster), WA, 10 ha		281
South Cervantes, WA, 1 ha		49,50
South Neptune, North I, SA, 51 ha		100
Stick (=Jubilee), WA, 2 ha	"calves", ? breeding status	50,111
Taylor, WA, 22 ha	6 pups 4-5 months old, February 1991	281
Termination, WA, 52 ha		100
The Pages, SA, 16 ha		105
West, WA, 30 ha		281
Wickham (=Stanley), WA, 43 ha	5 pups 4-5 months old, February 91	281
EQUUS ASINUS, Equidae - Donkey		
Bruny, TAS, 36735 ha	farm stock	147
Vanderlin, NT, 27690 ha		275
EQUUS CABALLUS, Equidae - Horse		
Badu (=Mulgrave), QLD, 10530 ha		236
Bernier, WA, 4267 ha	now absent	27
Bruny, TAS, 36735 ha		290
Carlisle, QLD, 550 ha		81
Curtis, QLD, 56345 ha		294
Deal, TAS, 1722 ha	? single animal, 1872, present 1929	289,290

Dirk Hartog, WA, 58640 ha	now absent	2
Facing, QLD, 2742 ha		65
Fraser, QLD, 165400 ha	now (1992) culled to ca 20	10,237, 316
Hunter, TAS, 7182 ha	2 in 1861	193
King, TAS, 110000 ha	present 1860s	290
Maatsuyker, TAS, 176 ha	'still' present 1848, present 1891, 2 in 1928, 1948	232, 290
Maria, TAS, 10401 ha	present 1884 50 present in 1888, now absent	59,292
Melville, NT, 573000 ha		316
Moreton, QLD, 17021 ha		10
Saint Bees, QLD, 987 ha		60
Swan, TAS, 210 ha		290
Tasman, TAS, 120 ha		290
Tasmania, TAS, 6200000 ha		66
Thistle, SA, 4113 ha		90
Three Hummock, TAS, 7110 ha		193
Vanderlin, NT, 27690 ha		275
Vansittart, TAS, 765 ha	at least 1 in 1882	289
Wedge, SA, 967 ha		90

SUS SCROFA, Suidae - Pig

#Cocos-Keeling (group), COM, 1420 ha		255
Babel, TAS, 430 ha	eradicated by Tasmanian Dept of Agriculture 1970s	268
Badu (=Mulgrave), QLD, 10530 ha		236
Bathurst, NT, 164520 ha	introduced 1824	256,307
Boigu, QLD, 7130 ha	domesticated	314
Brampton, QLD, 433 ha		60
Bremer, NT, 1374 ha		282
Bruny, TAS, 36735 ha	pair introduced by Cook 1777, did not establish	268
Croker, NT, 31000 ha		282
Curtis, QLD, 56345 ha		294
Darnley, QLD, 543 ha	domesticated	314
Dunk, QLD, 650 ha		60
Elcho, NT, 26950 ha		282
Flinders, QLD, 1480 ha	ca 1000 in 1987	60,268
Flinders, TAS, 134720 ha		7,141
Goose, TAS, 81 ha		65
Haslewood, QLD, 720 ha	eradication program	60,294
Hinchinbrook, QLD, 31756 ha		295
Horn, QLD, 5380 ha		314
Kangaroo, SA, 450000 ha		1,11
King, TAS, 110000 ha	present 1860s	290
Lady Julia Percy, VIC, 149 ha	present 1840-1863 1884, now absent	114,160
Lord Howe, NSW, 1455 ha		129,130
Maatsuyker, TAS, 176 ha	present 1908	290
Mabuiag (= Jervis), QLD, 570 ha	"once domesticated"	304
Maer (=Mer, Murray Is), QLD, 390 ha	probably introduced after arrival of Europeans	304
Magnetic, QLD, 5212 ha		294
Maria, TAS, 10401 ha	present 1884	292
Melville, NT, 573000 ha	introduced 1824	307
Milingimbi, NT, 5236 ha		282
Moreton, QLD, 17021 ha		10,93, 257
Norfolk, COM, 3450 ha	wild population eradicated	128
Prince of Wales, QLD, 19646 ha		314
Saibai, QLD, 10379 ha		94,314
Sir Graham Moore, WA, 2774 ha	introduced 1940s poisoned 1987	16
South Peron, NT, 485 ha		97
Stanley, QLD, 870 ha		60,317
Swan, TAS, 247 ha		7
Vansittart, TAS, 765 ha	present 1830, 150 in 1831	289,291
Yam (= Turtle-backed), QLD, 150 ha	domesticated	314

CAMELUS DROMEDARIUS, Camelidae - One-humped Camel

Dirk Hartog, WA, 58640 ha	present in 1916, now absent	2

AXIS AXIS, Cervidae - Chital

Snake, VIC, 4623 ha	now absent	73

AXIS PORCINUS, Cervidae - Hog Deer

Draper, WA, 15 ha		280
Drum, VIC, 79 ha		73
Little Snake, VIC, 486 ha	natural spread	17,73
Rotamah, Lake Victoria, VIC, 340 ha		73,144, 145
Snake, VIC, 4623 ha		17,58, 73
Sunday, VIC, 1034 ha		58

CERVUS ELEPHAS, Cervidae - Red Deer

Hinchinbrook, QLD, 31756 ha	introduced 1900-1930, not seen since 1930s	295

CERVUS TIMORENSIS, Cervidae - Rusa Deer

Friday, QLD, 500 ha	introduced 1912 from Molucca	1,58, 228,314
Hinchinbrook, QLD, 31756 ha	? species	58
Horn, QLD, 5380 ha		314
North East, NT, 375 ha		1,282
Possession, QLD, 520 ha	introduced 1914 from Prince of Wales Is.	1,58
Prince of Wales, QLD, 19646 ha	natural spread from Friday Island	1,58, 228,314
Saibai, QLD, 10379 ha	natural spread from PNG	314

CERVUS UNICOLOR, Cervidae - Sambar

Croker, NT, 31000 ha	natural spread	282
Flinders, SA, 3642 ha	? species, 4 landed 1832	219
French, VIC, 17470 ha	natural spread late 1800s, present 1991	17,53
Schouten, TAS, 2681 ha		301

DAMA DAMA, Cervidae - Fallow Deer

Maria, TAS, 10401 ha	released 1965	59,312
Phillip, VIC, 10116 ha	introduced late 1800s, now absent	17
Sunday, VIC, 1034 ha		73
Tasmania, TAS, 6200000 ha		1,4

BOS TAURUS, Bovidae - Cattle

Bathurst, NT, 164520 ha	introduced 1824	256,307
Big Green, TAS, 114 ha	present 1872	289
Black (Craggy), NT, 431 ha	now absent	278
Bruny, TAS, 36735 ha	farm stock	147, 290,291
Croker, NT, 31000 ha		282
Deal, TAS, 1722 ha	team of bullocks 1872, present in	139, 289,290
Dog, VIC, 140 ha		17
Flinders, TAS, 134720 ha	present 1884	66,289
Fraser, QLD, 165400 ha		10,237
Gabo, VIC, 150 ha	1847, 1959, 1972	88,232, 234
Great Dog, TAS, 377 ha	present 1872	289
Griffiths, VIC, 33 ha	not present since 1930s	184

Hinchinbrook, QLD, 31756 ha	"a few" run "earlier this (20th) century"; now absent	309
Hogan, TAS, 239 ha		132
Hunter, TAS, 7182 ha	present 1861, 150 in 1904, 500 in 1952, 200 in 1958	193
Inglis, NT, 8830 ha		282
King, TAS, 110000 ha	present 1860s	66,290
Little Dog, VIC, 72 ha		17
Maatsuyker, TAS, 176 ha	'few' in 1891	290
Maria, TAS, 10401 ha	present in 1884, 300 in 1888, now absent	59,292, 312
Middle Percy, QLD, 1969 ha		258
Norfolk, COM, 3450 ha		128
Phillip, VIC, 10116 ha		66
Preservation, TAS, 198 ha	? species, "used for stock-fattening", 1882	289
Prince of Wales, QLD, 19646 ha		228,314
Saint Bees, QLD, 987 ha		60
Snake, VIC, 4623 ha		17
Sunday, VIC, 1034 ha	grazed since at least 1860	17
Swan, TAS, 210 ha	bullock team present for >100 years	290
Sweers, QLD, 1219 ha		62
Tasmania, TAS, 6200000 ha		66
Three Hummock, TAS, 7110 ha	present 1911	193
Vanderlin, NT, 27690 ha		256,275
Vansittart, TAS, 765 ha	present in 1870s	289

BUBALIS BUBALIS, Bovidae - Water Buffalo

Bremer, NT, 1374 ha		282
Croker, NT, 31000 ha	natural spread	282
Melville, NT, 573000 ha	introduced 1824	256,307

CAPRA HIRCUS, Bovidae - Goat

#Duke (group), QLD,		294
#Repulse (group), QLD,	eradicated	294
Althorpe, SA, 81 ha	1939 (2-300), ? status now	45,114, 232
Anderson, TAS, 148 ha	200 in 1850s	289
Bedford (S island), WA, 310 ha	introduced 1920-30s, ?now	84
Bernier, WA, 4267 ha		27
Big, Five Islands, NSW, 19 ha	introduced 1888, eradicated by 1917	165
Bowen, NSW, 50 ha	one only, 1975	159
Brampton, QLD, 433 ha		60
Broughton, NSW, 138 ha	now absent	157
Cockatoo, WA, 508 ha	introduced 1920-30s, status now?	84,150
Cull (=Gull), WA, 46 ha	introduced 1935, 14-30 present	194
Curtis, QLD, 56345 ha		294
Dent, QLD, 338 ha	eradication underway 1991	294
Dirk Hartog, WA, 58640 ha		2
Dorre, WA, 5163 ha	single skeleton	98
Erith-Dover, TAS, 678 ha	numerous in 1872, absent 1970s	7,289
Fairfax, QLD, 21 ha	1898, 1936, 1965 (50), eradicated 1972	67,213, 235,294
Faure, WA, 5148 ha		83,262
Fitzroy, QLD, 325 ha		99
Flinders, QLD, 1480 ha		294
Gabo, VIC, 150 ha	1847	232
Goose, SA, 6 ha	present >50 yrs before 1973, now absent	248
Goose, TAS, 81 ha	lighthouse keeper	65,85
Grassy, QLD, 111 ha	eradicated	60,294
Hamilton, QLD, 603 ha	eradicated 1991	294
Hayman, QLD, 321 ha	believed eradicated	294
Henning, QLD, 38 ha	eradicated	60,294
Heron, QLD, 13 ha	now absent	156
Hook, QLD, 6161 ha	eradication underway 1991	60,294
Hoskyn, South, QLD, 5 ha	eradicated early 1970s	294
Hunter, TAS, 7182 ha	present 1861	193
Irvine, WA, 967 ha	present 1920-30s absent 1982	84
Kangaroo, SA, 450000 ha		11
King, TAS, 110000 ha	present 1860s	290
Koolan, WA, 2712 ha	introduced 1920-30s, ?status	84
Lady Elliott, QLD, 37 ha	present 1936, eradicated before 1969	213
Lady Musgrave, QLD, 9 ha	present 1898, 1927, 1936, 1946 removed 1974,	67,109, 213, 238 240
Lindeman, QLD, 610 ha	eradicated	294
Lion, NSW, 8 ha	single animal, removed	154
Long, QLD, 987 ha	eradication underway 1991	294
Lord Howe, NSW, 1455 ha	228 present in 1972	129,130
Maria, TAS, 10401 ha	'few' present in 1880s	292
Middle Percy, QLD, 1969 ha		146,258
Mistaken, WA, 10 ha	present ca 1841, now absent	174
Montagu, NSW, 49 ha	1967, 1973 (60), eradicated mid-1988	152, 233,259
Moreton, QLD, 17021 ha		10
Mount Adolphus, QLD, 674 ha		86
Norfolk, COM, 3450 ha	wild population eradicated	128
North Goulburn, NT, 4158 ha		256
North Molle, QLD, 219 ha	eradication underway 1991	294
Northwest, QLD, 108 ha	introduced, liberated 1925, absent 1946	240
Orpheus, QLD, 1160 ha	several hundred, eradication underway 1991	214,294
Pelorus, QLD, 339 ha		294
Prince of Wales, QLD, 19646 ha		314
Rabama (=Yabooma?), NT, 2653 ha		151
Raine, QLD, 30 ha	introduced 1844, none in 1961	119
Repulse, East, QLD,	eradicated	294
Repulse, North, QLD,	eradicated	294
Repulse, South, QLD,	eradicated	294
Saddleback, QLD, 53 ha	eradicated	294
Saint Bees, QLD, 987 ha		60
Seal, VIC, 18 ha	still present 1971	7,54, 73,137
Skull, NT, 635 ha		277
South Molle, QLD, 380 ha	eradicated	294
South Neptune, South I, SA, 45 ha	eradicated 1968	114,118
South Percy, QLD, 1280 ha	eradication underway 1991	60,294
South Solitary, NSW, 10 ha	now absent	155
Sunday, VIC, 1034 ha	introduced 1928, eradicated by dogs 1950	17
Sweers, QLD, 1219 ha		82
Tasman, TAS, 120 ha	"occasionally kept"	290

Thevenard, WA, 708 ha	single animal 1965-66	222
Truant, NT, 269 ha		282
Vanderlin, NT, 27690 ha		256,275
Vansittart, TAS, 765 ha	present in 1830, 600 in 1850s	289,291
Wedge, SA, 967 ha	now absent	253
West Sister, TAS, 714 ha		7
Woody, QLD, 563 ha		294

OVIS ARIES, Bovidae - Sheep

#Cocos-Keeling (group), COM, 1420 ha		255
Albany, QLD, 616 ha		65
Bald, WA, 720 ha	now absent	189
Bernier, WA, 4267 ha	now absent	27
Big Green, TAS, 114 ha	farmed since ca 1830, present 1872	91,289
Bruny, TAS, 36735 ha		66
Cape Barren, TAS, 46220 ha	present 1890s	66,289
Chalky, TAS, 39 ha	prior to 1945, now absent	185
Charley, WA, 101 ha	prior to 1944, now absent	203
Clarke, TAS, 8391 ha	'could carry up to 4000 sheep', 1862	289
Culeenup, WA, 51 ha		271
Cull (=Gull), WA, 46 ha	removed 1967	92,95, 194
Dirk Hartog, WA, 58640 ha	sheep station since 1890s	2
Doughboy, TAS, 16 ha		136
Faure, WA, 5148 ha	sheep station	83,262
Flinders, SA, 3642 ha		246
Flinders, TAS, 134720 ha	50 in 1832, present 1872	66,289, 291
Franklin, SA, 512 ha	not after 1915	243
Gabo, VIC, 150 ha	1959	88
Goose, TAS, 81 ha	'stock' present in 1872, present 1930s	65,290
Great Dog, TAS, 377 ha	200-300 in 1987	17,210, 289
Hamilton, QLD, 603 ha		60
Hogan, TAS, 239 ha		132,133
Hunter, TAS, 7182 ha	"a few always present"	193
Kangaroo, SA, 450000 ha		66
King, TAS, 110000 ha	present 1860s	66,290
Lady Julia Percy, VIC, 149 ha	introduced 1879, 1908, now absent	160
Little Dog, TAS, 65 ha	de-stocked for over 30 years	211
Little Green, TAS, 92 ha	23 ha of island is private property	209
Maatsuyker, TAS, 176 ha	present 'from time to time'	290
Maria, TAS, 10401 ha	present 1884, 5000 in 1888, 500 removed 1876, 2000 removed 1976, now absent	59,292, 312,313
Middle Percy, QLD, 1969 ha		60,258
Mount Chappell, TAS, 349 ha	300 present in 1987	205
Mount Chappell, TAS, 341 ha	? species, "livestock" present 1872	289
Ninth, TAS, 20 ha	'some few hundreds' in 1872	289
Norfolk, COM, 3450 ha		128
Phillip, VIC, 10116 ha		66
Preservation, TAS, 198 ha	? species, "used for stock-fattening", 1882	289
Prime Seal, TAS, 1219 ha	present 1872	289
Reevesby, SA, 373 ha	present 1937, now absent	242
Saint Bees, QLD, 987 ha		60
Saint Francis, SA, 809 ha	now absent	?
Saint Helens, TAS, 51 ha	grazing 1935-65, now absent	176
Schouten, TAS, 2681 ha	1840s-1978	229
Sloping, TAS, 108 ha	? species, evidence of grazing	135
South Molle, QLD, 380 ha	eradicated 1988	60,294
Sunday, VIC, 1034 ha	sheep introduced later than cattle	17
Swan, TAS, 210 ha	present 1830-31, 'flock' in 1860s, present 1945	290,291
Sweers, QLD, 1219 ha		82
Tasman, TAS, 120 ha	now absent	177,290
Tasmania, TAS, 6200000 ha		66
Taylor, SA, 255 ha	? record	115
Thistle, SA, 4113 ha	present 1955	90
Thomas, WA, 52 ha	now removed	92
Trefoil, TAS, 140 ha	nothing 1831, present 1861	193,201
Vansittart, TAS, 765 ha	2000 in 1870s	289
Waterhouse, TAS, 293 ha	present before 1860, 1876	289
Wedge, SA, 967 ha	1964 (2000), 1980 (600)	90,253
West Lewis, WA, 1974 ha	prior to 1900, now absent	3,216
Woody, WA, 108 ha	now absent	92,95

CROCIDURA ATTENUATA TRICHURA, Scorecidae - Christmas Island Shrew

Christmas, COM, 13470 ha		254,261

Key

Jurisdiction -

COM: Commonwealth Territory
QLD: Queensland
NSW: New South Wales
NT: Northern Territory
SA: South Australia
TAS: Tasmania
VIC: Victoria
WA: Western Australia

\# group of islands; unable to allocate record to specific island
introduced: introduced by humans
self introduced: natural range extension
? introduced: probably introduced by humans, requires verification
? record: record requires verification
? species: identity of mammal species requires verification
? status: current status requires verification

DATABASE 1B: CATALOGUE OF ISLANDS AND MAMMAL OCCURRENCES

ISLAND NAME, STATE/TERRITORY, AREA (ha), SPECIES	COMMENTS	REF. NO.
#CLAREMONT (ISLES), QLD		
Pteropus scapulatus	holotypes *P. elseyii*	294
#COCOS-KEELING (GROUP), COM, 1420 ha		
Oryctolagus cuniculus		255
Mus musculus		255
Rattus rattus	introduced 1878, ex shipwreck	255,263
Canis familiaris	dogs	255
Felis catus		255
Sus scrofa		255
Ovis aries		255
#CROCODILE (GROUP), NT		
Macropus agilis	? record	69
#DUKE (GROUP), QLD		
Capra hircus		294
#NEW YEAR (GROUP), TAS		
Mirounga leonina	extinct	100
#PERCY (ISLANDS), QLD		
Pteropus brunneus	holotype	294
#REPULSE (GROUP), QLD		
Capra hircus	eradicated	294
ACTAEON, TAS, 13 ha		
Oryctolagus cuniculus	low numbers in 1980	198
ADELE, WA, 247 ha		
Rattus exulans	introduced, ?Indonesian fishermen	20,21
ALBANY, QLD, 616 ha		
Macropus agilis	? record	69
Taphozous australis		257,294
Hipposideros cervinus	(syntype)	294
Rattus sordidus		20,21
Ovis aries		65
ALBATROSS, SA, 7 ha		
Neophoca cinerea		105
ALBATROSS, TAS, 24 ha		
Arctocephalus pusillus		100
ALGER, NT, 778 ha		
Petrogale brachyotis	? species	69
ALPHA, WA, 86 ha		
Hydromys chrysogaster		217
Rattus rattus	? shipwreck	26
ALTHORPE, SA, 81 ha		
Mus musculus		45
Felis catus		114
Arctocephalus forsteri		100
Capra hircus	1939 (2-300), ? status now	45,114, 232
ANDERSON, TAS, 148 ha		
Canis familiaris	wild dogs, present 1830, now absent	7,291
Felis catus	present 1830	291
Capra hircus	200 in 1850s	289
ANGEL, WA, 927 ha		
Rattus tunneyi		216
Vulpes vulpes	natural spread	28
Felis catus	natural spread	28
ASTELL, NT, 1143 ha		
Petrogale brachyotis	? species	69
AUGUSTUS, WA, 19023 ha		
Dasyurus hallucatus		3,16
Pseudantechinus ningbing		16
Isoodon auratus		3,16
Petrogale concinna		3,16
Petaurus breviceps		3,16
Pteropus alecto	? species	16
Taphozous georgianus		3,16,311
Hipposideros ater		16
Zyzomys argurus		16
Zyzomys woodwardi		3,16
Canis familiaris		16
BABEL, TAS, 430 ha		
Macropus rufogriseus	introduced ca 1965	22
Thylogale billardieri	? extinct, reference 200 says common	7,22, 200
Pteropus poliocephalus		7
Mus musculus		22
Felis catus		22,200
Sus scrofa	eradicated by Tasmanian Dept of Agriculture 1970s	268
BADGER, TAS, 1235 ha		
Macropus rufogriseus	? extinct	7,22,301
Thylogale billardieri	extinct	7,22
Mus musculus		22
BADU (= MULGRAVE), QLD, 10530 ha		
Perameles nasuta	introduced, "within living memory"	236
Equus caballus		236
Sus scrofa		236
BAIRD, SA, 18 ha		
Bettongia penicillata	introduced 1982	45,46, 270
Mus musculus		45
BALD, WA, 720 ha		
Setonix brachyurus		1,3,189
Rattus fuscipes		3
Ovis aries	now absent	189
BALLEE, WA, 19 ha		
Macropus fuliginosus		271
Oryctolagus cuniculus		271
Vulpes vulpes		271
BARROW, WA, 23590 ha		
Planigale maculata		14
Pseudantechinus macdonnellensis		3,25
Isoodon auratus		3,25
Bettongia lesueur		3,14,25
Lagorchestes conspicillatus		3,14,25
Macropus robustus		25,14
Petrogale lateralis		25
Trichosurus arnhemensis		3,25
Taphozous georgianus		25
Eptesicus finlaysoni		5
Hydromys chrysogaster		3,21,25
Mus musculus	warehouse only, eradicated	3
Pseudomys nanus		1,3,25,21
Rattus rattus	introduced, first recorded 1990, poisoned 1991	264,265
Zyzomys argurus		3,21,25
BAT (CAPE BREWSTER), WA, 7 ha		
Taphozous georgianus		3,16,311
Eptesicus caurinus		3,5,16
BATHURST, NT, 164520 ha		
Dasyurus hallucatus		1
Isoodon macrourus		8,307
Macropus agilis		18,69, 307
Trichosurus arnhemensis		8,18,307
Petaurus breviceps		1,18,307
Pteropus alecto		1
Taphozous saccolaimus		1
Hipposideros diadema		1
Eptesicus caurinus		256
Conilurus penicillatus		1,18
Hydromys chrysogaster		1,21
Melomys burtoni		18,21
Mesembriomys gouldii		1,18,21
Rattus rattus		1,21
Rattus tunneyi		1
Sus scrofa	introduced 1824	256,307
Bos taurus	introduced 1824	256,307

BATHURST, WA, 610 ha		
Taphozous georgianus		41
Hipposideros stenotis		41
Eptesicus caurinus		41
Zyzomys woodwardi		3,44
BEAUMONT, WA, 32 ha		
Arctocephalus forsteri		280
Neophoca cinerea	3 pups 4-5 months old, February 91	281
BEDFORD (S ISLAND), WA, 310 ha		
Capra hircus	introduced 1920-30s, ?now	84
BEDOUT, WA, 24 ha		
Rattus rattus	poisoned 1981, now absent	3
BENNISON, VIC, 5 ha		
Oryctolagus cuniculus		88
Vulpes vulpes	natural spread	17,96
BENTINCK, QLD, 13800 ha		
Planigale maculata		18
Conilurus penicillatus		21
BERNIER, WA, 4267 ha		
Perameles bougainville		3,27
Bettongia lesueur		3,27
Lagorchestes hirsutus		3,27
Lagostrophus fasciatus		3,27
Eptesicus finlaysoni		27,5
Nyctophilus geoffroyi		27
Pseudomys albocinereus		1,3,27,21
Pseudomys desertor	? no recent records	27
Pseudomys fieldi		1,3,27, 40,21
Felis catus	? pet, now absent	27
Equus caballus	now absent	27
Capra hircus		27
Ovis aries	now absent	27
BIG GREEN, TAS, 114 ha		
Oryctolagus cuniculus	8000 destroyed in 10 years to ?1872, now absent	7,289
Rattus rattus		7,22,54, 95
Bos taurus	present 1872	289
Ovis aries	farmed since ca 1830, present 1872	91,289
BIG, FIVE ISLANDS, NSW, 19 ha		
Oryctolagus cuniculus	introduced before 1843, absent 1988	165,259
Capra hircus	introduced 1888, eradicated by 1917	165
BIG, SMITH'S LAKE, NSW, 22 ha		
Rattus fuscipes		257
BIGGE, WA, 17850 ha		
Tachyglossus aculeatus		16
Dasyurus hallucatus		16
Petrogale burbidgei		3,16,47
Wyulda squamicaudata		3,16
Taphozous georgianus		3,16,311
Eptesicus caurinus		3,5
Pseudomys delicatulus		3,16
Zyzomys woodwardi		3,16
Canis familiaris		16
BIRD CLUB, SA, 8 ha		
Bettongia penicillata	introduced 1979, now absent	270
BIRD, EAST, SA, 1 ha		
Vulpes vulpes	natural spread	45
BLACK (CRAGGY), NT, 431 ha		
Rattus villosissimus		275
Zyzomys argurus		275
Bos taurus	now absent	278
BLUEBELL, WA, 53 ha		
Rattus rattus	? shipwreck	26
BOIGU, QLD, 7130 ha		
Sus scrofa	domesticated	314
BOOBY, QLD, 6 ha		
Pteropus scapulatus	occasional visitor	207

BOODIE, WA, 170 ha		
Bettongia lesueur	extinct 1988	9
Rattus rattus	eradicated by poison 1985	9,61
BOOMERANG, WA, 5 ha		
Isoodon auratus	connects to Barrow Is. at low tide	218
Trichosurus arnhemensis	connects to Barrow Is. at low tide	218
Hydromys chrysogaster		218
Rattus rattus	eradicated by poison 1983	61
BOONGAREE, WA, 4935 ha		
Dasyurus hallucatus		3,16
Petrogale burbidgei		3,16,47
Wyulda squamicaudata		3,16
Pteropus alecto		3,16
Taphozous georgianus		3,16,311
Hipposideros stenotis		3,16
Eptesicus caurinus		3,5,16
Rattus tunneyi		3,16
Zyzomys woodwardi		3,16
BORDA, WA, 728 ha		
Petrogale concinna		3,16
Zyzomys woodwardi		3,16
BOSTON, SA, 967 ha		
Macropus eugenii	introduced 1971 ex Kangaroo Is.	45,269 270,274
BOULLANGER, WA, 34 ha		
Parantechinus apicalis		3,35
Sminthopsis griseoventer		3,35
Macropus fuliginosus	introduced, single animal in 1985, absent 1991	49
Mus musculus		3,35
BOWEN, NSW, 50 ha		
Oryctolagus cuniculus		159
Rattus rattus	? species	159
Capra hircus	one only, 1975	159
BOXER, WA, 166 ha		
Rattus rattus		39
BOYDONG, QLD, 16 ha		
Rattus rattus	extensive population, June 1990	317
BRAMBLE CAY, QLD, 7 ha		
Melomys rubicola		112
BRAMPTON, QLD, 433 ha		
Macropus giganteus	introduced	223
Sus scrofa		60
Capra hircus		60
BREAKSEA, WA, 102 ha		
Oryctolagus cuniculus		3,102, 172
Canis familiaris	pet dog ca 1900, now absent	172
BREAKSEA (MIDDLE), TAS, 20 ha		
Oryctolagus cuniculus		56
Hydromys chrysogaster		56
BREMER, NT, 1374 ha		
Macropus agilis		282
Canis familiaris	domestic dogs	282
Sus scrofa		282
Bubalis bubalis		282,
BRIBIE, QLD, 17500 ha		
Tachyglossus aculeatus		10
Phascolarctos cinereus		257
Macropus giganteus		10,257
Wallabia bicolor		10,257
Trichosurus vulpecula		10
Pseudocheirus peregrinus		10
Miniopterus australis		257
Hydromys chrysogaster		10
Melomys burtoni		10
Mus musculus		10
Rattus lutreolus		10,20
Xeromys myoides		257

Canis familiaris		10
Felis catus		10
BRISK, QLD, 48 ha		
Trichosurus vulpecula	? species	78
BROUGHTON, NSW, 138 ha		
Oryctolagus cuniculus	introduced 1906	157
Rattus rattus	? species	157
Felis catus		157
Capra hircus•	now absent	157
BROUGHTON (=PASSAGE), WA, 16 ha		
Neophoca cinerea	1 pup 4-5 months old, February 1991	281
BROWSE, WA, 12 ha		
Mus musculus		3,16
BRUNY, TAS, 36735 ha		
Tachyglossus aculeatus		59,301
Ornithorhynchus anatinus	? record unverified	301,310
Antechinus minimus		148,301
Antechinus swainsonii		301
Dasyurus viverrinus		301,310
Sminthopsis leucopus		301
Isoodon obesulus		301
Perameles gunnii		301
Bettongia gaimardii		59,301
Potorous tridactylus		59,147, 301
Macropus rufogriseus		59
Thylogale billardieri		59,301
Trichosurus vulpecula		147,291
Cercartetus lepidus		301
Oryctolagus cuniculus		147
Rattus lutreolus		301
Canis familiaris	domestic dogs, present 1829 with Aborigines	147,291
Felis catus		147
Equus asinus	farm stock	147
Equus caballus		290
Sus scrofa	pair introduced by Cook 1777, did not establish	268
Bos taurus	farm stock	147,290, 291
Ovis aries		66
BRUSH, NSW, 35 ha		
Rattus rattus	? record, dead specimen in July 1974	153
BULLER, WA, 1 ha		
Neophoca cinerea		49
BUMAGA, NT, 333 ha		
Petrogale brachyotis	? species	69
BURRUP, WA, 11804 ha		
Tachyglossus aculeatus		338
Dasykaluta rosamondae		338
Dasyurus hallucatus		338
Ningaui timealeyi		338
Planigale maculata		338
Macropus robustus		338
Macropus rufus	1 dead specimen, possibly transported	338
Petrogale rothschildi		338,339
Pteropus scapulatus	vagrant	338
Taphozous georgianus		338
Eptesicus finlaysoni		338
Hydromys chrysogaster		338
Mus musculus		338
Pseudomys delicatulus		338
Pseudomys hermannsburgensis		338
Rattus rattus		338
Zyzomys argurus		338
Canis familiaris	domestic dogs	338
Vulpes vulpes		338
Felis catus		338
BYAM MARTIN, WA, 810 ha		
Hipposideros ater		16
CABBAGE TREE, NSW, 30 ha		
Oryctolagus cuniculus	introduced ca 1900	164
CAFFARELLI, WA, 230 ha		
Dasyurus hallucatus		41
CAMPBELL, WA, 40 ha		
Rattus rattus	? shipwreck	26
CAPE BARREN, TAS, 46220 ha		
Tachyglossus aculeatus		7,22,301
Sminthopsis leucopus		301
Vombatus ursinus	extinct	7
Potorous tridactylus	extinct	7,22
Macropus rufogriseus		7,22,301
Thylogale billardieri		7,22,301
Pseudocheirus peregrinus		7,22, 291,301
Cercartetus nanus	? species	7,22
Chalinolobus morio		301
Mus musculus		22
Rattus lutreolus		7,22,301
Rattus rattus		22
Canis familiaris	present 1831, ? pet, 1874	289,291
Felis catus		22
Arctocephalus forsteri		100
Ovis aries	present 1890s	66,289
CARLIA, WA, 450 ha		
Dasyurus hallucatus	? species	16
Mesembriomys macrurus		3,16
CARLISLE, QLD, 550 ha		
Macropus giganteus	? natural spread from Brampton Is.	81,223
Pteropus alecto	? species	223
Pteropus poliocephalus		223
Pteropus sp.		257
Melomys cervinipes		81,257
Equus caballus		81
CARNAC, WA, 16 ha		
Nyctinomus australis		315
Oryctolagus cuniculus	introduced 1820s, 1934, poisoned 1970s, now absent	3,38
Hydromys chrysogaster	? record	286
Mus musculus		3,315
CASUARINA, SOUTH, SA, 9 ha		
Arctocephalus forsteri		100,105
CAT, TAS, 41 ha		
Hydromys chrysogaster		22
CENTRE, SIR ED PELLEW, NT, 9222 ha		
Pseudantechinus mimulus		275
Isoodon macrourus		275
Macropus agilis		13,275
Petrogale brachyotis		69,275
Taphozous georgianus		275,311
Conilurus penicillatus		13,21, 275
Hydromys chrysogaster		13,275
Melomys burtoni		275
Rattus tunneyi		275
Zyzomys argurus		275
Canis familiaris		275
CHALKY, TAS, 39 ha		
Ovis aries	prior to 1945, now absent	185
CHAMPAGNY, WA, 1456 ha		
Zyzomys woodwardi	? species	16
CHARLEY, WA, 101 ha		
Rattus fuscipes		203
Ovis aries	prior to 1944, now absent	203
CHATHAM, WA, 69 ha		
Rattus fuscipes		3,75
CHINAMAN, VIC, 50 ha		
Phascolarctos cinereus	introduced 1930, 1931, 1957	17,73, 297
Wallabia bicolor		73

CHRISTMAS, COM, 13470 ha		
Pteropus melanotus		261
Pteropus sp.		254
Rattus exulans	recorded 1933	261
Rattus macleari	extinct 1908	254
Rattus nativitatis	extinct 1908	254
Rattus rattus	introduced 1898-1908	254, 261,263
Felis catus		254
Crocidura attenuata trichura		254,261
CHURCHILL, VIC, 45 ha		
Oryctolagus cuniculus		87
CITADEL, VIC, 20 ha		
Oryctolagus cuniculus	introduced 1913, absent 1978	17,87, 88,120
CLARKE, TAS, 8391 ha		
Antechinus minimus		7,22,301
Sminthopsis leucopus		7,22,301
Vombatus ursinus	extinct	7
Potorous tridactylus	extinct	7,22
Macropus rufogriseus	extinct	7,22
Thylogale billardieri		7,22,301
Oryctolagus cuniculus		7,22
Canis familiaris	present 1830	291
Felis catus		22
Ovis aries	'could carry up to 4000 sheep', 1862	289
CLIFF, QLD, 37 ha		
Pteropus conspicillatus	? species	317
CLONMEL, VIC, 140 ha		
Mus musculus		296
COCKATOO, WA, 508 ha		
Taphozous georgianus		3,311
Capra hircus	introduced 1920-30s, status now?	84,150
CONILURUS (=MARGARET), WA, 329 ha		
Mesembriomys macrurus		3,41
COOPER, WA, 50 ha		
Arctocephalus forsteri		280
CORINGA CAY, SOUTHWEST, COM, 13 ha		
Rattus rattus		231
COTTON, NT, 1974 ha		
Petrogale brachyotis	? species	69
CRANNY, WA, 25 ha		
Arctocephalus forsteri		280
CRIBB, QLD, 80 ha		
Rattus fuscipes		20,257
CROKER, NT, 31000 ha		
Trichosurus arnhemensis		18
Canis familiaris	domestic dogs	282
Felis catus		282
Sus scrofa		282
Cervus unicolor	natural spread	282
Bos taurus		282
Bubalis bubalis	natural spread	282
CULEENUP, WA, 51 ha		
Isoodon obesulus		271
Macropus fuliginosus		271
Trichosurus vulpecula		271
Nyctinomus australis		271
Oryctolagus cuniculus		271
Hydromys chrysogaster		271
Mus musculus		271
Rattus rattus		271
Vulpes vulpes		271
Felis catus		271
Ovis aries		271
CULL (=GULL), WA, 46 ha		
Capra hircus	introduced 1935, 14-30 present	194
Ovis aries	removed 1967	92,95, 194
CURTIS, QLD, 56345 ha		
Tachyglossus aculeatus		294
Macropus giganteus		294
Petaurus breviceps		294

Pteropus sp.		294
Canis familiaris		294
Felis catus		294
Equus caballus		294
Sus scrofa		294
Capra hircus		294
DANGEROUS REEF, SA, 2 ha		
Neophoca cinerea		100, 105,170
DARCY (=NORTH HEYWOOD), WA, 4945 ha		
Petrogale concinna	? species	16
Zyzomys woodwardi		3,16
DARNLEY, QLD, 543 ha		
Sus scrofa	domesticated	314
DAW, WA, 212 ha		
Isoodon obesulus		3
Rattus fuscipes		3
Arctocephalus forsteri		52,280
Neophoca cinerea		34,50, 100
DE WITT, TAS, 518 ha		
Potorous tridactylus	? species	56,180
Thylogale billardieri		56,180, 301,310
Rattus lutreolus		56,180, 301
DEAL, TAS, 1722 ha		
Macropus rufogriseus		7
Thylogale billardieri	extinct	7
Trichosurus vulpecula		7,139
Eptesicus caurinus	present in 1890	139
Oryctolagus cuniculus		7,87
Rattus rattus		7,143
Canis familiaris	? pet	290
Felis catus	present in 1890	7,139, 143
Equus caballus	? single animal, 1872, present 1929	289,290
Bos taurus	team of bullocks 1872, present in 1890	139, 289,290
DELIVERANCE, QLD, 36 ha		
Felis catus	present ca 1888, still present 1928	303
DENHAM, QLD, 3034 ha		
Macropus agilis		69
DENT, QLD, 338 ha		
Trichosurus vulpecula	introduced by lighthouse keepers	294
Hydromys chrysogaster		257
Capra hircus	eradication underway 1991	294
DEPUCH, WA, 1121 ha		
Petrogale lateralis	extinct	3,36,37
Pteropus alecto	? species	3
Hydromys chrysogaster		3,37
Vulpes vulpes	natural spread	36
DIRK HARTOG, WA, 58640 ha		
Sminthopsis dolichura		3
Bettongia lesueur	extinct	2
Lagostrophus fasciatus	extinct, re-introduced 1970s, not successful	3,2
Eptesicus finlaysoni		2,3,5
Nyctophilus geoffroyi		3,2
Mus musculus		3,2
Pseudomys albocinereus		3,2
Pseudomys hermannsburgensis		3,2
Felis catus		3,2
Equus caballus	now absent	2
Camelus dromedarius	present in 1916, now absent	2
Capra hircus		2
Ovis aries	sheep station since 1890s	2

DIXON, WA, 495 ha		
Macropus robustus		72
Mus musculus		3
Pseudomys hermannsburgensis		3
DJEEGAREE, NT, 290 ha		
Petrogale brachyotis	? record, ? species	69
DOG, SA, 37 ha		
Rattus fuscipes		44,45
Neophoca cinerea		100
DOG, VIC, 140 ha		
Mus musculus		73
Rattus rattus		73
Bos taurus		17
DOLPHIN, WA, 3281 ha		
Dasyurus hallucatus		28
Macropus robustus		28
Petrogale rothschildi	declined	28
Taphozous georgianus		216
Rattus tunneyi		3,216
Zyzomys argurus		28
Vulpes vulpes	natural spread	28,216
Felis catus	natural spread	216
DORRE, WA, 5163 ha		
Perameles bougainville		3,27
Bettongia lesueur		3,27
Lagorchestes hirsutus		3,27
Lagostrophus fasciatus		3,27
Nyctophilus geoffroyi		27
Hydromys chrysogaster		101
Pseudomys albocinereus		3,27,21
Capra hircus	single skeleton	98
DOUGHBOY, TAS, 16 ha		
Ovis aries		136
DOUGHBOY, VIC, 2 ha		
Oryctolagus cuniculus	now absent	17,73,87, 166
Rattus rattus		166
DOUGLAS, WA, 30 ha		
Neophoca cinerea		100
DRAPER, WA, 15 ha		
Neophoca cinerea	3 pups 4-5 months old, February 1991	281
Axis porcinus		280
DRUM, VIC, 79 ha		
Oryctolagus cuniculus		73
Axis porcinus		73
DRYSDALE, NT, 5450 ha		
Petrogale brachyotis	? record, ? species	69
DUNK, QLD, 650 ha		
Tachyglossus aculeatus		77,257
Eptesicus troughtoni		257
Hydromys chrysogaster		257
Melomys cervinipes		257
Uromys caudimaculatus		77
Sus scrofa		60
EAST BEAGLE, WA, 2 ha		
Neophoca cinerea		49
EAST DOUBTFUL, WA, 13 ha		
Arctocephalus forsteri		106,280
EAST INTERCOURSE, WA, 300 ha		
Macropus robustus	before causeway to mainland	216
Vulpes vulpes	causeway to mainland 1968	216
Felis catus	causeway to mainalnd 1963	216
EAST KANGAROO, TAS, 147 ha		
Thylogale billardieri	extinct	7,22
Oryctolagus cuniculus	extinct	7
Mus musculus		22
EAST LEWIS, WA, 1018 ha		
Rattus tunneyi		216
EAST SISTER, TAS, 519 ha		
Sminthopsis leucopus	introduced	22,301
Thylogale billardieri		7,22,301
Trichosurus vulpecula	introduced 1920s	7,22
Mus musculus		22
Felis catus		22
EAST WALLABI, WA, 307 ha		
Macropus eugenii		3,48
Rattus fuscipes		3,20,48
EBA, SA, 91 ha		
Vulpes vulpes	natural spread	45
ECLIPSE (NEAR ALBANY), WA, 104 ha		
Oryctolagus cuniculus		51,102, 171
Arctocephalus forsteri		50,100, 171,280
Neophoca cinerea		138
ELCHO, NT, 26950 ha		
Isoodon macrourus		18
Macropus agilis		18,69
Trichosurus arnhemensis		18
Petaurus breviceps		18
Pteropus scapulatus		18
Macroderma gigas		18
Melomys burtoni		18
Zyzomys argurus		276,278
Canis familiaris	domestic dogs	282
Felis catus		282
Sus scrofa		282
ELIZABETH, VIC, 22 ha		
Oryctolagus cuniculus		87
ENDERBY, WA, 3190 ha		
Petrogale rothschildi		3,28
Pteropus scapulatus		216
Nyctophilus geoffroyi		216
Rattus tunneyi		216
Zyzomys argurus		3,216
ENGLISH, SA, 4 ha		
Neophoca cinerea		100,105
ERITH-DOVER, TAS, 678 ha		
Thylogale billardieri	extinct	7
Trichosurus vulpecula		7
Oryctolagus cuniculus	present in 1865, 1872, 1890, absent 1970s	7,139. 289,290
Capra hircus	numerous in 1872, absent 1970s	7,289
EYRE, SA, 984 ha		
Rattus fuscipes		45
FACING, QLD, 2742 ha		
Equus caballus		65
FAIRFAX, QLD, 21 ha		
Rattus rattus	? species	239
Capra hircus	1898, 1936, 1965 (50), eradicated 1972	67,213 235,294
FANTOME, QLD, 635 ha		
Tachyglossus aculeatus		78
Trichosurus vulpecula	? species	78
FAURE, WA, 5148 ha		
Eptesicus caurinus		262
Mus musculus		262
Felis catus		262
Capra hircus		83,262
Ovis aries	sheep station	83,262
FENELON, SA, 81 ha		
Arctocephalus forsteri		105
Neophoca cinerea		105
FIGURE OF EIGHT, WA, 248 ha		
Mus musculus		39
FINGER, WA, 8 ha		
Arctocephalus forsteri		280
FISHER, TAS, 1 ha		
Hydromys chrysogaster		167
Rattus rattus	introduced 1971, eradicated 1974	167
FITZROY, QLD, 325 ha		
Pteropus conspicillatus	(holotype)	294
Capra hircus		99

FLAT WITCH, TAS, 65 ha		
Antechinus minimus		56,181,301
FLINDERS, QLD, 1480 ha		
Canis familiaris		63
Sus scrofa	ca 1000 in 1987	60,268
Capra hircus		294
FLINDERS, SA, 3642 ha		
Macropus eugenii	extinct between 1968-1974	45,246,247,252,269
Lepus capensis	now absent	113
Rattus rattus	? absent, ref. 247 says present	45,244,247
Felis catus		113,247
Neophoca cinerea		100
Cervus unicolor	? species, 4 landed 1832	219
Ovis aries		246
FLINDERS, TAS, 134720 ha		
Tachyglossus aculeatus		1,7,22,301
Antechinus minimus		7,22,54,55,301
Dasyurus maculatus	extinct	7
Isoodon obesulus	extinct	7,22
Vombatus ursinus		7,22,301
Macropus rufogriseus		7,22,301
Thylogale billardieri		7,22,301
Trichosurus vulpecula		7,22,301
Pseudocheirus peregrinus		7,22
Pseudocheirus peregrinus		7,22,301
Cercartetus nanus		7,22,301
Chalinolobus morio		301
Eptesicus darlingtoni		7,5
Eptesicus vulturnus		301
Nyctophilus geoffroyi	? species	7,302
Oryctolagus cuniculus	now absent	7,141
Hydromys chrysogaster		7,22,301
Mus musculus		7,21,22,141
Pseudomys novaehollandiae		293,301
Rattus lutreolus		7,20,22,301
Rattus rattus		7,22,141
Canis familiaris	wild dogs, 'kangaroo dogs' present 1872	7,289
Felis catus	present 1872	7,22,141,289
Sus scrofa		7,141
Bos taurus	present 1884	66,289
Ovis aries	50 in 1832, present 1872	66,289,291
FRANKLIN, SA, 512 ha		
Isoodon obesulus		19,45,107,244,245,252
Leporillus conditor		1,3,19,31,45,107,244,245
Neophoca cinerea		100,105,245
Ovis aries	not after 1915	243
FRASER, QLD, 165400 ha		
Tachyglossus aculeatus		10
Antechinus flavipes		10
Sminthopsis murina		10
Isoodon macrourus		10
Perameles nasuta		10
Macropus giganteus		10
Wallabia bicolor		1,10
Acrobates pygmaeus		10
Trichosurus caninus		10
Petaurus breviceps	? species	10
Pteropus alecto		1
Pteropus poliocephalus		1,10,257
Syconycteris australis		1
Rhinolophus megaphyllus		1
Nyctophilus geoffroyi	? species	10
Hydromys chrysogaster		10,21
Melomys burtoni		21
Melomys cervinipes		10
Pseudomys delicatulus		10
Pseudomys desertor	? record, not in reference 21	10
Rattus fuscipes		10,20
Rattus lutreolus		10,20
Rattus tunneyi		10,20,21
Canis familiaris	dingoes, not dogs	10,237
Felis catus		10
Equus caballus	now (1992) culled to ca 20	10,237,316
Bos taurus		10,237
FREELING, SA, 8 ha		
Neophoca cinerea		105
FRENCH, VIC, 17470 ha		
Tachyglossus aculeatus		53,73
Phascolarctos cinereus	introduced between 1880 and 1900	17,53,73,297
Potorous tridactylus		17,53,54,73
Oryctolagus cuniculus		17,73,87
Hydromys chrysogaster		53,73
Mus musculus		17,73
Rattus fuscipes		17,53,73
Rattus lutreolus		17,53,73
Felis catus		17,73
Cervus unicolor	natural spread late 1800s, present 1991	17,53
FRIDAY, QLD, 500 ha		
Macropus agilis		228
Cervus timorensis	introduced 1912 from Molucca	1,58,228,314
GABO, VIC, 150 ha		
Felis catus	1972	233
Bos taurus	1847, 1959, 1972	88,232,234
Capra hircus	1847	232
Ovis aries	1959	88
GARDEN, WA, 1054 ha		
Macropus eugenii		1,3
Nyctinomus australis		?
Felis catus		66
GEORGE ROCKS, TAS, 2 ha		
Oryctolagus cuniculus	introduced ca 1936	121,134,175
Rattus rattus		121,134,175
Arctocephalus pusillus		100
GERMEIN, SA, 173 ha		
Macropus fuliginosus	natural spread	45
Vulpes vulpes	natural spread	45
GIBBINGS, WA, 289 ha		
Macroglossus minimus		41
Taphozous flaviventris		41
Taphozous georgianus		41
Eptesicus caurinus		41
Miniopterus schreibersii		41
Nyctophilus arnhemensis		41
GIDLEY, WA, 798 ha		
Rattus rattus		3
Rattus tunneyi	? species	216
Vulpes vulpes	natural spread	28
Felis catus	natural spread	28
GLENNIE, WA, 40 ha		
Neophoca cinerea		100
GLOUCESTER, QLD, 2484 ha		
Petrogale persephone		274,294

Pteropus alecto		294
Melomys cervinipes		294
GOAT, SA, 285 ha		
Rattus fuscipes		3,20,44, 45,244
GOOSE, SA, 6 ha		
Mus musculus		248
Capra hircus	present >50 yr before 1973, now absent	248
GOOSE, TAS, 81 ha		
Sus scrofa		65
Capra hircus	lighthouse keeper	65,85
Ovis aries	'stock' present in 1872, present 1930s	65,290
GOOSE, WA, 56 ha		
Oryctolagus cuniculus		3
GRAHAM, NT, 784 ha		
Petrogale brachyotis	? record, ? species	69
GRANITE, SA, 32 ha		
Macropus eugenii	introduced ?1970s ex Kangaroo I, being removed	45, 269,270
Macropus fuliginosus	introduced, removed 1984	45,270
GRASSY, QLD, 111 ha		
Capra hircus	eradicated	60,294
GREAT DOG, TAS, 377 ha		
Thylogale billardieri	extinct	7,22
Pteropus poliocephalus		7
Oryctolagus cuniculus		17
Mus musculus		22,210
Rattus rattus		22,210
Canis familiaris	wild dogs, plentiful 1830	7,22,291
Vulpes vulpes		7,54
Felis catus		22,210
Bos taurus	present 1872	289
Ovis aries	200-300 in 1987	17,210
	present 1872	289
GREAT GLENNIE, VIC, 119 ha		
Antechinus minimus		17,55,73
Rattus fuscipes		7,54,73
Rattus rattus		73
GREAT PALM, QLD, 5590 ha		
Tachyglossus aculeatus		78
Isoodon macrourus	? species	68
Petrogale assimilis		1,305
Trichosurus vulpecula	? species	78
GREEN, SA, 2 ha		
Oryctolagus cuniculus		45
GREEN (NEAR CAIRNS), QLD, 15 ha		
Rattus rattus		317
GREEN ISLET, NORTH, WA, 2 ha		
Oryctolagus cuniculus	poisoned, now absent	38,49
GREEN ISLET, SOUTH, WA, 8 ha		
Oryctolagus cuniculus	poisoned, now absent	49,103
GREENLY, SA, 141 ha		
Macropus eugenii	introduced 1905 ex Kangaroo Is.	115,44, 249,252, 269,270, 279
Rattus fuscipes		20,44,45, 21,249
Neophoca cinerea		100,249
GRIFFITHS, VIC, 33 ha		
Oryctolagus cuniculus		184
Rattus norvegicus		184
Rattus rattus		184
Vulpes vulpes	natural spread, ? absent 1965	184
Bos taurus	not present since 1930s	184
GROOTE EYLANDT, NT, 225820 ha		
Tachyglossus aculeatus		12
Dasyurus hallucatus		12,18
Planigale maculata		12,18
Isoodon macrourus		12,18
Macropus agilis		69
Onychogalea unguifera		284
Petrogale brachyotis		1
Petrogale concinna		1
Petaurus breviceps		1,12,18
Pseudocheirus dahli		1,18
Pteropus alecto		1
Pteropus scapulatus		284
Taphozous flaviventris		18
Taphozous georgianus		278
Macroderma gigas		18
Chalinolobus nigrogriseus		18
Eptesicus caurinus	? species	278
Myotis adversus		1
Nyctophilus arnhemensis		1,18
Pipistrellus tenuis		284
Conilurus penicillatus		1,18,12 21
Hydromys chrysogaster		1,12,18, 21
Melomys burtoni		1,18,21
Notomys aquilo		1,12,18, 21
Pseudomys delicatulus		1,12,18, 21
Rattus rattus		1,21
Rattus tunneyi		1,21
Zyzomys argurus		1,12,18, 21
Canis familiaris		278
GULUWURU, NT, 7625 ha		
Petrogale brachyotis	? record, ? species	69
HAMILTON, QLD, 603 ha		
Capra hircus	eradicated 1991	294
Ovis aries		60
HAREBY, SA, 46 ha		
Oryctolagus cuniculus		45
HASLEWOOD, QLD, 720 ha		
Pteropus alecto		294
Rhinolophus megaphyllus		294
Hydromys chrysogaster		294
Melomys cervinipes		294
Sus scrofa	eradication program	60,294
HAULOFF ROCK, WA, 25 ha		
Arctocephalus forsteri		280
HAUY, WA, 110 ha		
Rattus tunneyi		3,216
HAYMAN, QLD, 321 ha		
Melomys cervinipes	holotype *M. limicauda*	294
Capra hircus	believed eradicated	294
HEARD, COM, 37500 ha		
Mirounga leonina		131
HENNING, QLD, 38 ha		
Hydromys chrysogaster		294
Capra hircus	eradicated	60,294
HERMITE, WA, 836 ha		
Isoodon auratus	extinct	26
Lagorchestes conspicillatus	extinct	3,26
Eptesicus finlaysoni		26
Hydromys chrysogaster		26
Mus musculus		217
Rattus rattus	? shipwreck	3,26
Felis catus	? shipwreck	26
HERON, QLD, 13 ha		
Macropus giganteus	introduced, now absent	156
Macropus parryi	introduced, now absent	156

Rattus rattus	? species, eradicated 1964-5, now absent	156,238
Canis familiaris	dogs, now absent	213
Felis catus	now absent	156,238
Capra hircus	now absent	156
HIDDEN, WA, 1974 ha		
Dasyurus hallucatus		41
Petrogale concinna		3,44
Macroglossus minimus		41
Taphozous georgianus		41
Eptesicus caurinus		41
Miniopterus schreibersii		41
Mesembriomys macrurus		41
HINCHINBROOK, QLD, 31756 ha		
Tachyglossus aculeatus		295
Isoodon macrourus		295
Perameles nasuta		215,295
Macropus agilis		69,215, 295
Petaurus breviceps	? species	295
Nyctimene robinsoni		215,295
Syconycteris australis		215,295
Hipposideros diadema		215,295
Miniopterus australis		215,295
Miniopterus schreibersii		215,295
Myotis adversus		215
Nyctophilus bifax		215
Hydromys chrysogaster		215,295
Melomys burtoni		215,295
Melomys cervinipes		215,295
Rattus fuscipes		20,215, 295
Uromys caudimaculatus		1,21,215, 295
Canis familiaris	dingo	215,295
Sus scrofa		295
Cervus elephas	introduced 1900-1930, not seen since 1930s	295
Cervus timorensis	? species	58
Bos taurus	"a few" run "earlier this (20th) century" now absent	309
HINDMARSH, SA, 5860 ha		
Rattus lutreolus		20
HIPPOLYTE, TAS, 5 ha		
Arctocephalus pusillus	? breeding	195
HOGAN, TAS, 239 ha		
Rattus lutreolus		7,20,133
Bos taurus		132
Ovis aries		132,133
HOOD, WA, 96 ha		
Rattus fuscipes		110,193
Arctocephalus forsteri		106,193, 280,285
HOOK, QLD, 6161 ha		
Macropus robustus	introduced, now absent	294
Pteropus alecto	colony	294
Taphozous georgianus		294
Rhinolophus megaphyllus		294
Melomys cervinipes		294
Capra hircus	eradication underway 1991	60,294
HOPKINS, SA, 112 ha		
Rattus fuscipes		45
HORN, QLD, 5380 ha		
Sus scrofa		314
Cervus timorensis		314
HOSKYN, SOUTH, QLD, 5 ha		
Capra hircus	eradicated early 1970s	294
HOWICK, QLD, 446 ha		
Rattus rattus		317
HUMMOCK, VIC, 313 ha		
Wallabia bicolor		73
Mus musculus		73
Pseudomys novaehollandiae		73
Rattus lutreolus		73
HUNTER, TAS, 7182 ha		
Antechinus minimus		301
Potorous tridactylus		7
Macropus rufogriseus	? extinct	7
Thylogale billardieri		7,301
Trichosurus vulpecula		7,301
Oryctolagus cuniculus	present 1890, now absent	193
Hydromys chrysogaster		301
Canis familiaris	present 1830 (sealers), 10 kangaroo dogs in 1851	193,291
Equus caballus	2 in 1861	193
Bos taurus	present 1861, 150 in 1904, 500 in 1952, 200 in 1958	193
Capra hircus	present 1861	193
Ovis aries	"a few always present"	193
ILE DU GOLFE, TAS, 70 ha		
Antechinus minimus		186
INDIAN, NT, 2781 ha		
Isoodon macrourus		276
INGLIS, NT, 8830 ha		
Petrogale brachyotis	? record, ? species	69
Bos taurus		282
IRVINE, WA, 967 ha		
Macroglossus minimus		41
Eptesicus caurinus		41
Zyzomys woodwardi		3,44
Capra hircus	present 1920-30s, absent 1982	84
JEEGARNYEEJIP, WA, 15 ha		
Macropus fuliginosus		271
Nyctinomus australis		271
Oryctolagus cuniculus		271
Mus musculus		271
Vulpes vulpes		271
Felis catus		271
JENNALA, WA, 15 ha		
Oryctolagus cuniculus		271
Vulpes vulpes		271
JIRRGARRI, NT, 701 ha		
Petrogale brachyotis	? record, ? species	69
JUDGEMENT ROCKS, TAS, 2 ha		
Arctocephalus pusillus		100,138
KANGAROO, SA, 450000 ha		
Tachyglossus aculeatus		1,11
Ornithorhynchus anatinus	introduced	11
Dasyurus maculatus	extinct	1,11
Dasyurus viverrinus	extinct	11
Phascogale tapoatafa	extinct	11
Sminthopsis aitkeni	early references record as *Sminthopsis murina*	24,11,76
Isoodon obesulus		1,11
Lasiorhinus latifrons	introduced, 1 pair, failed to establish	11
Phascolarctos cinereus	introduced	1,11
Bettongia penicillata	? record, extinct	1
Bettongia lesueur	introduced 1924, 1926, now extinct	11
Macropus eugenii		1,3,11
Macropus fuliginosus		1,11
Trichosurus vulpecula		1,3,11
Pseudocheirus peregrinus	introduced	11
Cercartetus concinnus		1,11
Cercartetus lepidus		1,11
Pteropus scapulatus		11
Chalinolobus gouldii		1,11
Chalinolobus morio		11
Eptesicus darlingtoni		11,5
Nyctophilus geoffroyi		11

Nyctinomus australis		11
Oryctolagus cuniculus	introduced, failec to establish	1,11
Mus musculus		1,11
Rattus fuscipes		1,11,20, 21
Rattus lutreolus		1,11,20, 21
Rattus rattus •		1,11,21
Canis familiaris	wild dogs	11
Felis catus		1,11
Arctocephalus forsteri		11,100, 105
Neophoca cinerea		1,11,100
Sus scrofa		1,11
Capra hircus		11
Ovis aries		66
KANOWNA, VIC, 32 ha		
Arctocephalus pusillus		100
KATERS, WA, 1775 ha		
Petrogale burbidgei		3,16,47
Zyzomys woodwardi		3,16
KEAST, WA, 40 ha		
Rattus tunneyi		3,216
KENDREW, WA, 6 ha		
Zyzomys argurus		3,216
KERMADEC (= WEDGE), WA, 24 ha		
Neophoca cinerea		50,100
KING, TAS, 110000 ha		
Tachyglossus aculeatus		7,301
Ornithorhynchus anatinus		7,301, 310
Antechinus minimus		7,301
Dasyurus maculatus	extinct	7
Vombatus ursinus	extinct	7
Potorous tridactylus		7,301
Macropus rufogriseus		7,301
Thylogale billardieri		7,301
Trichosurus vulpecula		7,301
Pseudocheirus peregrinus		7,301
Cercartetus nanus		7,301
Macroglossus minimus	extinct	100
Pteropus poliocephalus		7
Chalinolobus gouldii		301
Nyctophilus geoffroyi		7,301
Mus musculus	present in 1887	7,21, 140,142
Rattus lutreolus		7,20,301
Rattus rattus		7,142
Canis familiaris	wild dogs, present in 1887	64,140
Felis catus	present in 1887	7,140, 142
Mirounga leonina	600 in 1802, extinct	100,290
Equus caballus	present 1860s	290
Sus scrofa	present 1860s	290
Bos taurus	present 1860s	66,290
Capra hircus	present 1860s	290
Ovis aries	present 1860s	66,290
KING HALL, WA, 209 ha		
Pteropus scapulatus		41
Eptesicus caurinus		41
KINGFISHER (=N WOOD), WA, 1017 ha		
Hydromys chrysogaster		16
KOOLAN, WA, 2712 ha		
Dasyurus hallucatus		3
Pteropus alecto		3
Taphozous georgianus		3,311
Macroderma gigas		?
Hipposideros ater	? species	3
Rhinonicterus aurantius		3
Chalinolobus nigrogriseus		3
Capra hircus	introduced 1920-30s, ?status	84
LABU, NT, 40 ha		
Macropus agilis		275

LACHLAN, WA, 1296 ha		
Pteropus alecto		41
Taphozous georgianus		41
Melomys burtoni		41
LACY, SA, 113 ha		
Rattus fuscipes		45
LADY ELLIOTT, QLD, 37 ha		
Canis familiaris	dog, one (pet?), removed 1969	213
Capra hircus	present 1936, eradicated before 1969	213
LADY JULIA PERCY, VIC, 149 ha		
Eptesicus caurinus	present 1840-1863, now absent	123
Oryctolagus cuniculus	1 pair released 1868, present 1979	89,114, 123,160
Arctocephalus pusillus		100,160
Sus scrofa	present 1840-1863, 1884, now absent	114,160
Ovis aries	introduced 1879, 1908, now absent	160
LADY MUSGRAVE, QLD, 9 ha		
Capra hircus	present 1898, 1927, 1936, 1946 removed 1974	67,109, 213,238, 240
LEGENDRE, WA, 1286 ha		
Rattus tunneyi		3,20
Zyzomys argurus		3,28
Vulpes vulpes	natural spread	3,28
Felis catus	natural spread	28
LEO, WA, 21 ha		
Oryctolagus cuniculus	2 prs released 1971-2, poisoned 1976, now absent	38
LEWIS, SA, 11 ha		
Neophoca cinerea		100
LIBKE (NR MACKENZIE), WA, 24 ha		
Arctocephalus forsteri		280
LIGUANEA, SA, 129 ha		
Rattus fuscipes		45
LINDEMAN, QLD, 610 ha		
Pteropus alecto	colony	294
Eptesicus troughtoni	? species, possibly *E. pumilus*	226
Rattus rattus	resort	294
Capra hircus	eradicated	294
LINGNOONGANEE, QLD, 1103 ha		
Macropus agilis		69
LION, NSW, 8 ha		
Hydromys chrysogaster		154
Mus musculus		154
Rattus rattus	? species, ? absent since 1968	154
Capra hircus	single animal, removed	154
LION, WA, 11 ha		
Neophoca cinerea		100
LITTLE (ADJ. LEWIS), SA, 2 ha		
Oryctolagus cuniculus		45
LITTLE BOYDONG, QLD, 3 ha		
Rattus rattus	? species	317
LITTLE BROUGHTON, NSW, 36 ha		
Rattus rattus	? species	158
LITTLE DOG, TAS, 65 ha		
Mus musculus		22,211
Rattus rattus		211
Canis familiaris	wild dogs, "several" in 1831	7,291
Felis catus		22,211
Ovis aries	de-stocked for over 30 years	211
LITTLE DOG, VIC, 72 ha		
Bos taurus		17

LITTLE GOOSE, SA, 2 ha		
Mus musculus		248
LITTLE GREEN, TAS, 92 ha		
Felis catus		22,209
Ovis aries	23 ha of Island is private property	209
LITTLE SNAKE, VIC, 486 ha		
Phascolarctos cinereus	introduced	17
Macropus giganteus	natural spread	17
Wallabia bicolor	natural spread	17,73
Axis porcinus	natural spread	17,73
LITTLE YUNDERUP, WA, 1 ha		
Oryctolagus cuniculus		271
Vulpes vulpes		271
LIZARD, QLD, 850 ha		
Pteropus alecto		279
Hipposideros ater		279
Canis familiaris	2 in 1880	303
LONG, QLD, 987 ha		
Isoodon macrourus	? extinct, last reported mid-1960s	294
Macropus agilis	introduced, now absent	294
Macropus giganteus	introduced, now absent	294
Pteropus alecto	colony	294
Hydromys chrysogaster		294
Rattus rattus	resort	294
Capra hircus	eradication underway 1991	294
LONG, TAS, 307 ha		
Thylogale billardieri	extinct	7,22
LONG, WA, 1356 ha		
Petrogale concinna		3,41
Rattus rattus	? species	41
LORD HOWE, NSW, 1455 ha		
Mus musculus		130
Rattus rattus	from shipwreck,1919	130
Canis familiaris	wild dogs	130
Felis catus		130
Sus scrofa		129,130
Capra hircus	228 present in 1972	129,130
LOUISA, TAS, 21 ha		
Potorous tridactylus	joined to Tasmania periodically by tombolo	56,179
Thylogale billardieri	natural spread, joined to Tasmania by tombolo	56,179, 310
Rattus lutreolus	? species, joined to Tasmania by tombolo	56,179
LOUNDS, SA, 7 ha		
Neophoca cinerea		105
MAATSUYKER, TAS, 176 ha		
Antechinus minimus		56,57, 161,301
Arctocephalus forsteri		273
Equus caballus	"still" present 1848, present 1891, 2 in 1928, 1948	232,290
Sus scrofa	present 1908	290
Bos taurus	"few" in 1891	290
Ovis aries	present "from time to time"	290
MABUIAG (= JERVIS), QLD, 570 ha		
Sus scrofa	"once domesticated"	304
MACKENZIE (= ROUND), WA, 48 ha		
Neophoca cinerea		192
MACQUARIE, TAS, 11800 ha		
Oryctolagus cuniculus		127
Mus musculus		127
Rattus rattus	introduced 1880-1908	127,263
Felis catus	introduced 1810-20	127
Arctocephalus forsteri		100
Mirounga leonina		100
MAER (=MER, MURRAY IS), QLD, 390 ha		
Melomys burtoni	(holotype *Uromys murinus* Thomas)	294
Rattus exulans		20,21
Sus scrofa	probably introduced after arrival of Europeans	304
MAGNETIC, QLD, 5212 ha		
Phascolarctos cinereus	introduced	294
Petrogale assimilis		1,294
Nyctimene robinsoni		226
Pteropus alecto		226,257
Syconycteris australis		226
Miniopterus australis		226
Scotorepens balstoni		226
Hydromys chrysogaster		32,21
Felis catus		294
Sus scrofa		294
MAI (ADJ. ALBANY), QLD, 18 ha		
Macropus agilis	? species.	70
MALUS, WA, 170 ha		
Rattus tunneyi		216
MARCHINBAR, NT, 21190 ha		
Dasyurus hallucatus		276
Petrogale brachyotis		69,276, 308
Macroglossus minimus		276
Pteropus alecto		276
Taphozous georgianus		276
Eptesicus caurinus	? species	276
Melomys burtoni		276,278
Zyzomys argurus		276
Canis familiaris		276
MARIA, NT, 3729 ha		
Isoodon macrourus		276
Pteropus alecto		276
MARIA, TAS, 10401 ha		
Tachyglossus aculeatus	43 introduced 1971	59,292, 312
Isoodon obesulus	42 introduced 1971	292,301, 312
Perameles gunnii	55 introduced 1971	292,301, 312
Vombatus ursinus	28 introduced from Flinders Is. in 1971	292,312
Bettongia gaimardii	123 introduced 1971	292,301, 312
Potorous tridactylus	136 introduced 1971	59,292, 301,312
Macropus giganteus	45 introduced in 1969-70	59,292, 301,312, 313
Macropus rufogriseus	127 introduced 1969-70	292,301, 312,313
Thylogale billardieri	13 introduced 1971	59,292, 301,312
Trichosurus vulpecula	15 introduced 1971	59,292, 312
Pseudocheirus peregrinus	61 introduced 1971	59,292, 301,312
Cercartetus nanus		59,301 312
Oryctolagus cuniculus	now absent	312
Hydromys chrysogaster	? record, no specimen?	59,301, 312
Mus musculus		59,312
Rattus lutreolus		20,301, 312
Rattus rattus		59,312
Canis familiaris	dogs, present 1884	292
Felis catus		59,312
Arctocephalus pusillus		100

Equus caballus	present 1884,50 present in 1888, now absent	59,292
Sus scrofa	present 1884	292
Dama dama	released 1965	59,312
Bos taurus	present in 1884, 300 in 1888, now absent	59,292 312
Capra hircus•	"few" present in 1880s	292
Ovis aries	present 1884, 5000 in 1888, 500 removed 1876, 2000 removed 1976, now absent	59,292, 312,313
MASILLON, SA, 202 ha		
Rattus fuscipes		45
MEEYIP, WA, 7 ha		
Oryctolagus cuniculus		271
Mus musculus		271
Vulpes vulpes		271
MELOMYS (=M WOOD), WA, 678 ha		
Melomys burtoni	? species	16
MELVILLE, NT, 573000 ha		
Tachyglossus aculeatus		284
Dasyurus hallucatus		1
Sminthopsis virginiae		18,8
Isoodon macrourus		8,307
Macropus agilis	? record, ? species	69,307
Trichosurus arnhemensis		8,18,307
Petaurus breviceps		1,18, 276,307
Macroglossus minimus		18
Pteropus alecto		1
Taphozous saccolaimus		1
Hipposideros diadema		1
Eptesicus caurinus		256
Nyctophilus arnhemensis		284
Nyctophilus bifax		18
Conilurus penicillatus		1,18,21
Hydromys chrysogaster		1,18,21
Melomys burtoni		18,21
Mesembriomys gouldii		1,18,21
Rattus rattus		1,21
Rattus tunneyi		18,20,21
Xeromys myoides		21,30
Canis familiaris		63
Equus caballus		316
Sus scrofa	introduced 1824	307
Bubalis bubalis	introduced 1824	256,307
MICHAELMAS, WA, 93 ha		
Antechinus flavipes		3
Oryctolagus cuniculus		102,173
Rattus fuscipes		3,173
MIDDLE (ABROLHOS), WA, 19 ha		
Oryctolagus cuniculus	now absent	3
MIDDLE (RECHERCHE), WA, 1036 ha		
Macropus eugenii		3,191
MIDDLE (NEAR BARROW), WA, 350 ha		
Isoodon auratus		3
Rattus rattus		3
MIDDLE DOUBTFUL, WA, 58 ha		
Antechinus flavipes		3
Oryctolagus cuniculus	? record	3
Arctocephalus forsteri		50,106
Neophoca cinerea		50
MIDDLE LACEPEDE, WA, 42 ha		
Rattus rattus	poisoned 1986, now absent	3
MIDDLE MANGROVE, WA, 113 ha		
Rattus tunneyi		3,20
MIDDLE OSBORNE, WA, 2252 ha		
Zyzomys woodwardi		3,16
Canis familiaris		16
MIDDLE PERCY, QLD, 1969 ha		
Macropus giganteus	? species, introduced	258

Bos taurus		258
Capra hircus		146,258
Ovis aries		60,258
MILINGIMBI, NT, 5236 ha		
Petrogale concinna		18
Macroderma gigas		3
Hipposideros ater	? species	3
Canis familiaris	domestic dogs	282
Felis catus		282
Sus scrofa		282
MISTAKEN, WA, 10 ha		
Oryctolagus cuniculus	poisoned 1977, 1978, 1980, re-invaded	102,174
Rattus rattus		38
Capra hircus	present ca 1841, now absent	174
MOA, QLD, 17441 ha		
Nyctophilus bifax		302
MONDRAIN, WA, 810 ha		
Petrogale lateralis		3,187
Rattus fuscipes		3,20,187
MONTAGU, NSW, 49 ha		
Oryctolagus cuniculus	present 1967	152,233
Mus musculus		152
Arctocephalus pusillus		100, 152,233
Capra hircus	1967, 1973 (60), eradicated mid-1988	152 233,259
MORETON, QLD, 17021 ha		
Isoodon macrourus		10,257
Trichosurus vulpecula		10
Petaurus breviceps	? species	10
Pteropus poliocephalus		10,93, 257
Pteropus sp.		257
Taphozous flaviventris		93,311
Hydromys chrysogaster		10,257
Mus musculus		257
Rattus sordidus		20,21, 257
Rattus sordidus		294
Rattus tunneyi		10,20, 257
Rattus villosissimus		20
Felis catus		10
Equus caballus		10
Sus scrofa		10,93, 257
Capra hircus		10
MORIARTY ROCKS, TAS, 3 ha		
Arctocephalus pusillus		138
MORLEY, WA, 7 ha		
Oryctolagus cuniculus	introduced 1970s, poisoned 1976, now absent	38
MORNINGTON, QLD, 97020 ha		
Macropus agilis		69
Rattus tunneyi		1
Canis familiaris		67
MOUNT ADOLPHUS, QLD, 674 ha		
Capra hircus		86
MOUNT CHAPPELL, TAS, 341 ha		
Antechinus minimus		301
Mus musculus		205
Rattus rattus		205
Felis catus		22
Ovis aries	300 present in 1987 ? species, "livestock" 289 present 1872	205
MT DUTTON BAY (SW), SA, 3 ha		
Macropus fuliginosus	natural spread	45
MUD, VIC, 60 ha		
Oryctolagus cuniculus	"almost" eradicated 1980s	73,124, 208

MUNGARY (ISLAND PT), SA, 3 ha		
Mus musculus		248
MUTTON BIRD, NSW, 8 ha		
Isoodon macrourus	? species, natural spread	163
Mus musculus		163
Rattus norvegicus		163
Canis familiaris	wild dogs, natural spread	163
Vulpes vulpes	natural sṕread, one shot 1975	163
Felis catus	natural spread	163
NEW YEAR, TAS, 85 ha		
Arctocephalus pusillus	? species, 4300 taken in 1802	289
NEW YEAR, WA, 19 ha		
Arctocephalus forsteri		280
NEWRY, QLD, 51 ha		
Isoodon macrourus		294
Phascolarctos cinereus	introduced	294
Trichosurus vulpecula	? introduced	294
Rattus rattus	resort	294
NIGHT, QLD, 61 ha		
Pteropus alecto	5000+	317
NINTH, TAS, 20 ha		
Felis catus		7
Ovis aries	"some few hundreds" in 1872	289
NOOK, WA, 30 ha		
Neophoca cinerea	2 pups 4-5 months old, February 1991	281
NORFOLK, COM, 3450 ha		
Chalinolobus gouldii		128
Eptesicus caurinus		128
Rattus rattus	introduced pre-1977	128,263
Sus scrofa	wild population eradicated	128
Bos taurus		128
Capra hircus	wild population eradicated	128
Ovis aries		128
NORTH (ABROLHOS), WA, 176 ha		
Macropus eugenii	introduced ex Wallabi Is 1950s?, died out, re-introduced 1987	3,42
Mus musculus	introduced 1970s	288
NORTH (GAMBIER), SA, 66 ha		
Oryctolagus cuniculus		45
Rattus fuscipes		44,45
Neophoca cinerea		100,105
NORTH BICKERS, SA, 6 ha		
Oryctolagus cuniculus	? record, skull only	45
Mus musculus		45
NORTH CORONATION, WA, 4038 ha		
Pteropus alecto		3,16
Zyzomys argurus		3,16
NORTH DOUBLE, WA, 12 ha		
Rattus rattus	eradicated by poison 1983	3,61
NORTH EAST, NT, 375 ha		
Cervus timorensis		1,282
NORTH EAST PERCY, QLD, 217 ha		
Uromys caudimaculatus	? species	79
NORTH FISHERMAN, WA, 1 ha		
Neophoca cinerea		49,50
NORTH GIDLEY, WA, 259 ha		
Hydromys chrysogaster		216
Vulpes vulpes	natural spread	81
NORTH GOULBURN, NT, 4158 ha		
Capra hircus		256
NORTH KEPPEL, QLD, 436 ha		
Trichosurus vulpecula	introduced	224
Pteropus alecto		223
NORTH MALUS, WA, 8 ha		
Eptesicus finlaysoni		3,216
Rattus tunneyi	connects to Malus Is. at low water	3,216
NORTH MOLLE, QLD, 219 ha		
Hydromys chrysogaster		294
Melomys cervinipes		294
Capra hircus	eradication underway 1991	294
NORTH NEPTUNE, WEST I, SA, 170 ha		
Rattus fuscipes		45
NORTH PERON, NT, 1766 ha		
Planigale ingrami		276
Macropus agilis	? record, ? species	69
Trichosurus arnhemensis		276
NORTH REEF, QLD, 2 ha		
Felis catus		213
NORTH STRADBROKE, QLD, 26344 ha		
Tachyglossus aculeatus		15
Isoodon macrourus		10,15, 257
Phascolarctos cinereus		10,15
Macropus agilis		10,15,69
Macropus giganteus		10,15
Wallabia bicolor		1,10,15, 257
Acrobates pygmaeus		15
Trichosurus vulpecula		10,15
Petaurus breviceps	? species	10,15
Pteropus poliocephalus		10,257
Hydromys chrysogaster		10,15, 257
Melomys burtoni		10,21
Melomys cervinipes		10,15, 21,257
Mus musculus		10
Rattus lutreolus		10,20,15
Rattus rattus		10
Rattus sordidus		20
Rattus tunneyi		10,20,21
Xeromys myoides		1,29
Felis catus		10
NORTH TWIN PEAK, WA, 272 ha		
Macropus eugenii		3,39
Rattus fuscipes		3
NORTH, SIR ED PELLEW, NT, 5778 ha		
Pseudantechinus mimulus		272,275
Macropus agilis		13,275
Petrogale brachyotis	? species	69,275
Taphozous georgianus		275
Macroderma gigas		275
Eptesicus finlaysoni		275
Nyctophilus arnhemensis		275
Hydromys chrysogaster		275
Melomys burtoni		275
Pseudomys delicatulus		275
Rattus tunneyi		275,276
Rattus villosissimus		275
Zyzomys argurus		275
NORTHWEST, QLD, 108 ha		
Felis catus	present 1925, eradicated 1986	230,241, 267
Capra hircus	introduced, liberated 1925, absent 1946	240
NORTHWEST, WA, 106 ha		
Rattus rattus	? shipwreck	26
OLIVE, SA, 16 ha		
Neophoca cinerea		105
ONE TREE, QLD, 5 ha		
Taphozous flaviventris	vagrant	306
ORPHEUS, QLD, 1160 ha		
Tachyglossus aculeatus		294
Isoodon macrourus		294

Oryctolagus cuniculus	released ? 1987, eradication underway 1991	294
Capra hircus	several hundred, eradication underway 1991	214,294
OUTER NEWRY, QLD, 49 ha		
Trichosurus vulpecula	? introduced	294
PARTNEY, SA, 38 ha		
Oryctolagus cuniculus		45
PASCO, WA, 2 ha		
Rattus rattus	poisoned 1985, now absent	61
PASLEY, WA, 54 ha		
Neophoca cinerea	pups 4-5 months old, February 1991	281
PEARSON, NORTH, SA, 164 ha		
Petrogale lateralis		1,19,44, 45,250, 252
Rattus fuscipes		3,19,20, 44,45,21, 250
Neophoca cinerea		100
PEARSON, SOUTH, SA, 39 ha		
Petrogale lateralis	accidentally released 1960	251,270
PEDRA BRANCA, TAS, 3 ha		
Arctocephalus pusillus		178
PELORUS, QLD, 339 ha		
Capra hircus		294
PELSAERT, WA, 120 ha		
Oryctolagus cuniculus	established from shipwreck 1880s, now absent	260,299
PENGUIN, WA, 12 ha		
Oryctolagus cuniculus		108
Mus musculus	introduced ca 1920s	108,212
PERFORATED, SA, 58 ha		
Rattus fuscipes		45
PHILLIP, COM, 224 ha		
Oryctolagus cuniculus	now eradicated?	128
PHILLIP, VIC, 10116 ha		
Tachyglossus aculeatus		53,73
Vombatus ursinus		73
Phascolarctos cinereus	introduced 1923	17,53, 73,297
Potorous tridactylus	? record	54,73
Thylogale billardieri	single record 1840, now extinct	73
Wallabia bicolor		73
Wallabia bicolor		80
Trichosurus vulpecula		73
Pseudocheirus peregrinus		73
Pteropus poliocephalus		73
Chalinolobus gouldii		73
Chalinolobus morio		73
Eptesicus darlingtoni		73
Eptesicus regulus		73
Eptesicus vulturnus		73
Miniopterus schreibersii		73
Myotis adversus		73
Nyctophilus geoffroyi		73
Lepus capensis		73
Oryctolagus cuniculus		17,54, 73,87
Hydromys chrysogaster		53,73
Mus musculus		17,73
Rattus rattus		73
Vulpes vulpes	natural spread	17,54, 73,96
Felis catus		17,54
Dama dama	introduced late 1800s, now absent	17
Bos taurus		66
Ovis aries		66
PIGEON, WA, 3 ha		
Rattus rattus	poisoned, now absent	3
POSSESSION, QLD, 520 ha		
Taphozous australis		311
Cervus timorensis	introduced 1914 from Prince of Wales Is.	1,58
PRESERVATION, TAS, 198 ha		
Macropus rufogriseus	extinct	7
Thylogale billardieri	extinct	22
Bos taurus	? species, 'used for stock-fattening', 1882	289
Ovis aries	? species, 'used for stock-fattening', 1882	289
PRIME SEAL, TAS, 1219 ha		
Antechinus minimus		7,22,301
Thylogale billardieri		7,22,301
Trichosurus vulpecula	introduced 1920s	7,22,301
Hydromys chrysogaster		22,301
Mus musculus		22
Felis catus		22
Ovis aries	present 1872	289
PRIMROSE, WA, 35 ha		
Rattus rattus	? shipwreck	26
PRINCE OF WALES, QLD, 19646 ha		
Nyctophilus bifax		302
Sus scrofa		314
Cervus timorensis	natural spread from Friday Island	1,58, 228,314
Bos taurus		228,314
Capra hircus		314
PURDIE, SA, 14 ha		
Neophoca cinerea		105
QUAIL, VIC, 480 ha		
Phascolarctos cinereus	introduced 1930, 1931, 1932, 1933 and 1947	73,297
Oryctolagus cuniculus		17,87
Mus musculus		73
Vulpes vulpes		17
RABAMA (=YABOOMA?), NT, 2653 ha		
Petaurus breviceps		151
Pteropus scapulatus	? species	151
Canis familiaris	dingoes & domestic dogs	151
Felis catus	? may not be feral	151
Capra hircus		151
RABBIT, QLD, 312 ha		
Isoodon macrourus		294
Phascolarctos cinereus	introduced	294
Trichosurus vulpecula	? introduced	294
Oryctolagus cuniculus	chinchilla rabbit farmed 1930s, now absent	294
RABBIT, SA, 15 ha		
Oryctolagus cuniculus		45
RABBIT, VIC, 26 ha		
Antechinus minimus		296
Oryctolagus cuniculus	extinct, myxomatosis poisoned? 1968	7,54,88, 126,182
RABBIT ROCK, VIC, 1 ha		
Oryctolagus cuniculus	present 1912, now absent	183
RAINE, QLD, 30 ha		
Capra hircus	introduced 1844, none in 1961	119
RARAGALA, NT, 9232 ha		
Petrogale brachyotis	? record, ? species	69
RAT, WA, 56 ha		
Mus musculus	present many years before 1987	287

Rattus rattus	present 1840, poisoned 1991	3
Felis catus	introduced ca 1900 ?	103
RAYMOND, LAKE VICTORIA, VIC, 769 ha		
Phascolarctos cinereus	introduced 1953	73,149, 297
REEVESBY, SA, 373 ha		
Leporillus conditor	introduced/ re-introduced 1990	283
Mus musculus		45
Felis catus	eradicated 1990	45
Ovis aries	present 1937, now absent	242
REID ROCKS, TAS, 9 ha		
Arctocephalus pusillus		100,138
REPULSE, EAST, QLD		
Capra hircus	eradicated	294
REPULSE, NORTH, QLD		
Capra hircus	eradicated	294
REPULSE, SOUTH, QLD		
Capra hircus	eradicated	294
RIMBIJA, NT, 211 ha		
Petrogale brachyotis	? record, ? species	69
ROBBINS, TAS, 9835 ha		
Potorous tridactylus		7
Macropus rufogriseus		7
Thylogale billardieri		7
Trichosurus vulpecula		7
ROCKY, QLD, 38 ha		
Rattus rattus	present since at least 1930	204
Felis catus	now absent	67,204
ROCKY, WA, 30 ha		
Arctocephalus forsteri		280
ROCKY (S OF GREENLY), SA, 13 ha		
Arctocephalus forsteri		105
RODD, NSW, 1 ha		
Oryctolagus cuniculus	present before 1859, now absent	225
ROSEMARY, WA, 1152 ha		
Petrogale rothschildi		3,28
Hydromys chrysogaster		216
Pseudomys hermannsburgensis		28
Zyzomys argurus		3,28
Felis catus	single animal introduced July 1989	216
ROTAMAH, LAKE VICTORIA, VIC, 340 ha		
Tachyglossus aculeatus		73,145
Vombatus ursinus		144,145
Macropus giganteus		73,144, 145
Wallabia bicolor		73,144, 145
Trichosurus vulpecula		145
Pseudocheirus peregrinus		145
Cercartetus nanus		73,145
Chalinolobus gouldii		73,145
Chalinolobus morio		73,145
Eptesicus darlingtoni		73
Eptesicus regulus		73,145
Eptesicus sagittula		145
Eptesicus vulturnus		73,145
Miniopterus australis		73
Miniopterus schreibersii		73
Nyctophilus geoffroyi		73,145
Oryctolagus cuniculus		73,145
Mus musculus		73,145
Rattus lutreolus		73,145
Rattus rattus		73,145
Canis familiaris	wild dogs	145
Vulpes vulpes	causeway to mainland	145
Felis catus	causeway to mainland	145
Axis porcinus		73,144, 145
ROTTNEST, WA, 1705 ha		
Setonix brachyurus		1,3,162
Nyctinomus australis		?
Mus musculus		3,162
Rattus rattus	? species	3
Felis catus	numbers controlled for many years	3
Neophoca cinerea	colony extinct	50
ROUND (NOT MACKENZIE), WA, 32 ha		
Neophoca cinerea		100
RUSSELL, QLD, 1748 ha		
Planigale maculata		74
SADDLEBACK, QLD, 53 ha		
Tachyglossus aculeatus	? introduced	294
Capra hircus	eradicated	294
SAIBAI, QLD, 10379 ha		
Sus scrofa		94,314
Cervus timorensis	natural spread from PNG	314
SAINT ANDREW, WA, 1525 ha		
Isoodon macrourus		16
Pteropus alecto		16
Rattus tunndeyi		3,16
SAINT BEES, QLD, 987 ha		
Phascolarctos cinereus	? introduced	60
Equus caballus		60
Bos taurus		60
Capra hircus		60
Ovis aries		60
SAINT FRANCIS, SA, 809 ha		
Isoodon obesulus		19,45, 252
Bettongia penicillata	extinct, re-introduced 1980s	252,45
Rattus rattus	extinct, subfossil only	45,244
Canis familiaris	dog, 1922	252
Felis catus	present 1922, now absent ?	19,244. 252
Neophoca cinerea		100,105
Ovis aries	now absent	?
SAINT HELENS, TAS, 51 ha		
Oryctolagus cuniculus	introduced 1920, eradicated 1930, re-introduced 1975, now absent	176
Felis catus	introduced 1920s, absent by 1930s	176
Ovis aries	grazing 1935-65, now absent	176
SAINT MARGARET, VIC, 1934 ha		
Phascolarctos cinereus		73
Oryctolagus cuniculus		87
Mus musculus		73
Vulpes vulpes		73
SAINT PETER, SA, 3731 ha		
Bettongia penicillata	? species, extinct, re-introduced 1989	252
Macropus eugenii	extinct	45
Nyctophilus geoffroyi		45
Mus musculus		45
SALISBURY, WA, 368 ha		
Petrogale lateralis		3
Rattus fuscipes		3
Arctocephalus forsteri		34,50, 280
Neophoca cinerea		34
SALUTATION, WA, 162 ha		
Leporillus conditor	40 introduced July 1990	300
SANDLAND, WA, 1 ha		
Neophoca cinerea		100
SANDY (LACEPEDE IS), WA, 6 ha		
Rattus rattus	poisoned 1986, now absent	43

SCHOUTEN, TAS, 2681 ha		
Thylogale billardieri		59
Cervus unicolor		301
Ovis aries	1840s-1978	229
SEAFORTH, QLD, 21 ha		
Pteropus alecto	colony	294
SEAL, VIC, 18 ha		
Arctocephalus pusillus		100
Capra hircus	still present 1971	7,54, 73,137
SEAL ROCK, WA, 5 ha		
Arctocephalus forsteri		50,106, 280,285
SEAL ROCKS, NSW, 1 ha		
Arctocephalus pusillus		100
SEAL ROCKS, VIC, 1 ha		
Arctocephalus pusillus		100
SERRURIER (=LONG), WA, 274 ha		
Felis catus	single animal introduced 1987	219
SIMPSON, WA, 78 ha		
Macropus robustus		3
SIMS, NT, 42 ha		
Canis familiaris		63
SIR FREDERICK, WA, 389 ha		
Dasyurus hallucatus		41
Taphozous georgianus		41
SIR GRAHAM MOORE, WA, 2774 ha		
Hydromys chrysogaster		16
Melomys burtoni	? species	3,16
Sus scrofa	introduced 1940s, poisoned 1987	16
SIX MILE (PT DEMPSTER), WA, 10 ha		
Arctocephalus forsteri	? breeding	206
Neophoca cinerea		281
SKULL, NT, 635 ha		
Macropus agilis	? record, ? species	69
Melomys burtoni		275
Rattus villosissimus		275
Capra hircus		277
SLOPE, WA, 1 ha		
Vulpes vulpes	causeway to mainland	103
SLOPING, TAS, 108 ha		
Oryctolagus cuniculus		135
Ovis aries	? species, evidence of grazing	135
SNAKE, VIC, 4623 ha		
Antechinus minimus		73
Phascolarctos cinereus	introduced 1945	17,297
Macropus giganteus	extinct	17,73
Wallabia bicolor	extinct	17,73
Cercartetus nanus		73
Oryctolagus cuniculus	? present	17
Mus musculus		73
Rattus fuscipes		50,58
Rattus lutreolus		73
Vulpes vulpes		17
Axis axis	now absent	73
Axis porcinus		17,58,73
Bos taurus		17
SNAPPER, NSW, 1 ha		
Rattus norvegicus	present 1930s, ? species	225
SOUTH CERVANTES, WA, 1 ha		
Neophoca cinerea		49,50
SOUTH DOUBLE, WA, 23 ha		
Rattus rattus	eradicated by poison 1983	3,61
SOUTH EAST (MONTBELLO), WA, 13 ha		
Rattus rattus	? shipwreck	26
SOUTH HEYWOOD, WA, 768 ha		
Pseudantechinus ningbing		3,16
Zyzomys woodwardi	? species	16
SOUTH MANGROVE, WA, 29 ha		
Pteropus scapulatus		220

SOUTH MOLLE, QLD, 380 ha		
Macropus giganteus	introduced 1987, ? all same sex	294
Pteropus alecto	colony	294
Hydromys chrysogaster		294
Rattus rattus	single skull found	294
Felis catus	eradication attempted, not successful	294
Capra hircus	eradicated	294
Ovis aries	eradicated 1988	60,294
SOUTH MOUNT DUTTON, SA, 1 ha		
Oryctolagus cuniculus		45
SOUTH NEPTUNE, NORTH I, SA, 51 ha		
Arctocephalus forsteri		100,118
Neophoca cinerea		100
SOUTH NEPTUNE, SOUTH I, SA, 45 ha		
Capra hircus	eradicated 1968	114,118
SOUTH PERCY, QLD, 1280 ha		
Capra hircus	eradication underway 1991	60,294
SOUTH PERON, NT, 485 ha		
Macropus agilis	? record, ? species	69
Trichosurus arnhemensis		276
Melomys burtoni		276,278
Sus scrofa		97
SOUTH SOLITARY, NSW, 10 ha		
Oryctolagus cuniculus	? eradicated by myxoma 1975	155
Canis familiaris	? now absent	155
Capra hircus	now absent	155
SOUTH WEST OSBORNE, WA, 1326 ha		
Zyzomys woodwardi		3,16
SOUTH WEST, PELLEW, NT, 9517 ha		
Pseudantechinus mimulus		275
Macropus agilis		275
Hydromys chrysogaster		13,275
Melomys burtoni		275
Pseudomys nanus		1,13, 21,275
Rattus sordidus		275
Rattus tunneyi		275
Rattus villosissimus		20,13, 21,275
Zyzomys argurus		275
Canis familiaris		13,275
SOUTHPORT, TAS, 7 ha		
Oryctolagus cuniculus		197
Mus musculus		197
SPILSBY, SA, 405 ha		
Oryctolagus cuniculus	poisoned, ? result	45
STANLEY, QLD, 870 ha		
Sus scrofa		60,317
STERILE, TAS, 4 ha		
Oryctolagus cuniculus	? record	199
STICK (=JUBILEE), WA, 2 ha		
Neophoca cinerea	"calves", ? breeding status	50,111
STICKNEY, SA, 56 ha		
Oryctolagus cuniculus		45
SUGARLOAF ROCK, WA, 1 ha		
Mus musculus		3
SUNDAY, VIC, 1034 ha		
Antechinus swainsonii	? species	17
Macropus giganteus	natural spread	17
Wallabia bicolor	natural spread, eradicated by dogs 1950?	17
Cercartetus nanus		17,73
Oryctolagus cuniculus	now absent?, ref. 125 says present	17,73
Canis familiaris	wild dogs	17
Vulpes vulpes	natural spread	17
Felis catus		17
Axis porcinus		58
Dama dama		73

Bos taurus	grazed since at least 1860	17
Capra hircus	introduced 1928, eradicated by dogs 1950	17
Ovis aries	sheep introduced later than cattle	17
SUNDAY, WA, 1157 ha		
Isoodon auratus	? species	266
Petrogale concinna	extinct, approx. 1940	266
Macroglossus minimus		41
Eptesicus caurinus		41
Miniopterus schreibersii		41
Nyctophilus arnhemensis		41
Pipistrellus tenuis		41
Melomys burtoni		41
Rattus exulans		41
Rattus rattus		41
SWAN, TAS, 210 ha		
Canis familiaris	wild dogs, 30 in 1830	7,291
Felis catus	? pet	290
Equus caballus		290
Sus scrofa		7
Bos taurus	bullock team present for >100 years	290
Ovis aries	present 1830-31, "flock" in 1860s, present 1945	290,291
SWAN, VIC, 247 ha		
Oryctolagus cuniculus		73
Mastacomys fuscus	single record, now absent	7,73
SWEERS, QLD, 1219 ha		
Bos taurus		62
Capra hircus		82
Ovis aries		82
SYDNEY, QLD, 1026 ha		
Macropus agilis		69
TASMAN, TAS, 120 ha		
Felis catus		177,290
Equus caballus		290
Capra hircus	"occasionally kept"	290
Ovis aries	now absent	177,290
TASMANIA, TAS, 6200000 ha		
Tachyglossus aculeatus		1,4,301
Ornithorhynchus anatinus		1,4,301
Thylacinus cynocephalus	probably extinct	1,4
Antechinus minimus		1,4,301
Antechinus swainsonii		1,4,301
Dasyurus maculatus		1,4,301
Dasyurus viverrinus		1,4,301
Sarcophilus harrisii		1,4,301
Sminthopsis leucopus		1,4,301
Isoodon obesulus		1,4,301
Perameles gunnii		1,4,301
Vombatus ursinus		1,4,301
Bettongia gaimardii		1,4,301
Potorous tridactylus		1,4,301
Macropus giganteus		1,4,301
Macropus rufogriseus		1,4,301
Thylogale billardieri		1,4,301
Trichosurus vulpecula		1,4,301
Petaurus breviceps	introduced ca 1835	1,4,301
Pseudocheirus peregrinus		1,4,301
Cercartetus lepidus		1,4,301
Cercartetus nanus		1,4,301
Chalinolobus gouldii		1,4,301
Chalinolobus morio		1,4,301
Eptesicus darlingtoni		1,5,301
Eptesicus regulus		5,301
Eptesicus vulturnus		1,5,301
Falsistrellus tasmaniensis		1,4,301
Nyctophilus geoffroyi		1,4,301
Nyctophilus timoriensis		301,302
Lepus capensis		1,4
Oryctolagus cuniculus		1,4
Hydromys chrysogaster		1,301
Mastacomys fuscus		1,4,21, 301
Mus musculus		1,4,21
Pseudomys higginsi		1,421, 301
Pseudomys novaehollandiae		1,21, 293,301
Rattus lutreolus		1,4,20, 21,301
Rattus norvegicus		1,4,21
Rattus rattus		1,4,20,21
Canis familiaris	wild dogs	4,7
Felis catus		1,4
Equus caballus		66
Dama dama		1,4
Bos taurus		66
Ovis aries		66
TAYLOR, SA, 255 ha		
Macropus fuliginosus	introduced	45
Trichosurus vulpecula		45
Ovis aries	? record	115
TAYLOR, WA, 22 ha		
Neophoca cinerea	6 pups 4-5 months old, February 1991	281
TENTH, TAS, 1 ha		
Arctocephalus pusillus		100,138
TERMINATION, WA, 52 ha		
Neophoca cinerea		100
THE BROTHERS, SA, 1 ha		
Felis catus	? one present, ? date	202
THE NEEDLES, TAS, 6 ha		
Arctocephalus pusillus		138
THE PAGES, SA, 16 ha		
Neophoca cinerea		105
THE SKERRIES, VIC, 1 ha		
Arctocephalus pusillus		100
THE THUMBS, TAS, 1 ha		
Arctocephalus pusillus		196
THEVENARD, WA, 708 ha		
Leggadina lakedownensis	earlier refs refer to *L. forresti*	1,3,32, 21
Mus musculus	introduced 1986	3
Felis catus	single animal 196?-1972	222
Capra hircus	single animal 1965-66	222
THISTLE, SA, 4113 ha		
Macropus eugenii	extinct, ca 1855	90
Petrogale lateralis	introduced 1974	45,270
Trichosurus vulpecula		45
Equus caballus		90
Ovis aries	present 1955	90
THOMAS, WA, 52 ha		
Ovis aries	now removed	92
THREE BAYS, WA, 5 ha		
Mus musculus		227
THREE HUMMOCK, TAS, 7110 ha		
Ornithorhynchus anatinus	? record unverified	7,301, 310
Antechinus minimus	? species	7
Isoodon obesulus		7
Phascolarctos cinereus	introduced, failed to establish	7
Potorous tridactylus		7
Macropus rufogriseus	? extinct	7
Thylogale billardieri	? extinct, re-introduced	7,301
Trichosurus vulpecula		7,301
Oryctolagus cuniculus	1 in 1908, now absent	193
Hydromys chrysogaster		7,301

Canis familiaris	wild dogs, present 1830	7,291
Felis catus		7
Equus caballus		193
Bos taurus	present 1911	193
TOLLGATE, NSW, 5 ha		
Oryctolagus cuniculus	eradicated with 1080, 1987	2569
TOZER, WA, 15 ha		
Macropus robustus	connected to Dolphin Is. at low tide	216
TREFOIL, TAS, 140 ha		
Mus musculus		201
Ovis aries	nothing 1831, present 1861	193,201
TRIMOUILLE, WA, 450 ha		
Eptesicus finlaysoni		3,5,26
Hydromys chrysogaster		26
Rattus rattus	? shipwreck	3,26
Felis catus	? shipwreck	26
TROUBRIDGE, SA, 9 ha		
Felis catus	single animal, removed	45
TRUANT, NT, 269 ha		
Rattus sp.		282
Capra hircus		282
TUMBY, SA, 26 ha		
Oryctolagus cuniculus		45
UWINS, WA, 3240 ha		
Dasyurus hallucatus		3,16
Petrogale burbidgei	? species	16
Mesembriomys macrurus		3,16
VANDERLIN, NT, 27690 ha		
Dasyurus hallucatus		275
Planigale maculata		275
Macropus agilis		13,275
Petrogale brachyotis	? species	69,275
Taphozous georgianus		275
Hydromys chrysogaster		275
Melomys burtoni		275
Pseudomys delicatulus		275
Rattus tunneyi		275
Zyzomys argurus		275
Canis familiaris		13,275
Felis catus		13,275
Equus asinus		275
Equus caballus		275
Bos taurus		256,275
Capra hircus		256,275
VANSITTART, TAS, 765 ha		
Tachyglossus aculeatus	introduced	7,22
Macropus rufogriseus	extinct	7,22
Thylogale billardieri	extinct	7,22
Canis familiaris	wild dogs, 40 in 1840, ? now absent	7,291
Equus caballus	at least 1 in 1882	289
Sus scrofa	present 1830, 150 in 1831	289,291
Bos taurus	present in 1870s	289
Capra hircus	present in 1830, 600 in 1850s	289,291
Ovis aries	2000 in 1870s	289
VENUS BAY, ISLAND A (N), SA, 17 ha		
Bettongia penicillata	introduced 1980, ? status	45,46, 270
Mus musculus		45
VENUS BAY, ISLAND B (S), SA, 6 ha		
Oryctolagus cuniculus		45
VENUS BAY, ISLAND C (E), SA, 13 ha		
Oryctolagus cuniculus		45
WALDEGRAVE, SA, 335 ha		
Rattus fuscipes		44,45
WALKER, TAS, 634 ha		
Potorous tridactylus		7
Macropus rufogriseus		7

Thylogale billardieri		7
Canis familiaris	sealers' dogs, 1830	291
WARDANG, SA, 1756 ha		
Oryctolagus cuniculus		45,248
Mus musculus		248
Felis catus		45
WARNAWI, NT, 194 ha		
Petrogale brachyotis	? record, ? species	69
WATERHOUSE, TAS, 293 ha		
Antechinus minimus		7
Ovis aries	present before 1860, 1876	289
WATSON, NT, 1322 ha		
Macropus agilis		13
Rattus villosissimus		275
WEDGE, SA, 967 ha		
Lasiorhinus latifrons	introduced 1971	45,270
Bettongia penicillata	introduced 1983	45,46, 270
Petrogale lateralis	introduced 1975	45,270
Equus caballus		90
Capra hircus	now absent	253
Ovis aries	1964 (2000), 1980 (600)	90,253
WEDGE, WA, 2 ha		
Vulpes vulpes	natural spread *via* tombolo	103
WELD, WA, 39 ha		
Rattus tunneyi		3
WEST, SA, 14 ha		
Petrogale lateralis	introduced 1973, 1975, now absent	45,168, 270
Oryctolagus cuniculus	poisoned 1972-3, now absent	45,168
WEST, WA, 30 ha		
Arctocephalus forsteri		280
Neophoca cinerea		281
WEST INTERCOURSE, WA, 2300 ha		
Macropus robustus		216
WEST LACEPEDE, WA, 82 ha		
Rattus rattus	poisoned 1986, now absent	3
WEST LEWIS, WA, 1974 ha		
Petrogale rothschildi	15 (8m, 7f) introduced 1982, widespread in 1991	104
Rattus tunneyi		3,20,28
Ovis aries	prior to 1900, now absent	3,216
WEST MONCOEUR, TAS, 14 ha		
Arctocephalus pusillus		138
WEST SISTER, TAS, 714 ha		
Sminthopsis leucopus		7,22,301
Isoodon obesulus		7,22,301
Thylogale billardieri		7,22,301
Nyctophilus geoffroyi		7
Lepus capensis		7,22
Hydromys chrysogaster		22,301
Capra hircus		7
WEST WALLABI, WA, 587 ha		
Macropus eugenii		3,48
Rattus fuscipes		20,48
WEST, SIR ED PELLEW, NT, 13373 ha		
Phascogale tapoatafa		275
Melomys burtoni		275
Pseudomys delicatulus		13,21, 275
Rattus tunneyi		275
Zyzomys argurus		275
WESTALL (=COMBE), WA, 70 ha		
Petrogale lateralis		1,39
WHITLOCK, WA, 5 ha		
Parantechinus apicalis		35
Mus musculus		35
WHITSUNDAY, QLD, 10526 ha		
Petrogale inornata		294
Trichosurus vulpecula		294

Hydromys chrysogaster		294
Melomys cervinipes		294
Canis familiaris	wild dogs, present 1930s, 1974, now absent	294
WICKHAM (=STANLEY), WA, 43 ha		
Neophoca cinerea	5 pups 4-5 months old, February 91	281
WIGRAM, NT, 2061 ha		
Petrogale concinna		282
Petaurus breviceps		69,277, 282
Canis familiaris	domestic dogs, one dingo introduced	282
WILLIAMS, SA, 158 ha		
Rattus fuscipes		44
WILSON, WA, 90 ha		
Petrogale lateralis		1,3,39
WOLLASTON, WA, 798 ha		
Dasyurus hallucatus		16
Petrogale burbidgei	? species	16
Mesembriomys macrurus		3,16
Canis familiaris		16
WOODED, WA, 14 ha		
Oryctolagus cuniculus	introduced from Leo Is., poisoned 1976, now absent	38
WOODY, QLD, 563 ha		
Oryctolagus cuniculus		294
Capra hircus		294
WOODY, WA, 108 ha		
Macropus fuliginosus	introduced before 1976, present 1992	71,188
Pseudomys albocinereus	? species, no specimen, not found in 1992	33,21, 319
Rattus fuscipes	extinct	20,33
Rattus rattus	present 1950, 1992	33,188, 319
Ovis aries	now absent	92,95
WORALLGAROOK, WA, 8 ha		
Oryctolagus cuniculus		271
Vulpes vulpes		271
WRECK, QLD, 4 ha		
Rattus rattus	? species	213,230, 239
WRIGHT, SA, 2 ha		
Oryctolagus cuniculus	now absent	169
YAM (= TURTLE-BACKED), QLD, 150 ha		
Sus scrofa	domesticated	314
YANGIE BAY, SA, 6 ha		
Macropus fuliginosus	natural spread	45
Oryctolagus cuniculus		45
YUNDERUP, WA, 8 ha		
Macropus fuliginosus		271
Oryctolagus cuniculus		271
Mus musculus		271
Vulpes vulpes		271

Key:

Jurisdiction -

COM: Commonwealth Territory
QLD: Queensland
NSW: New South Wales
NT: Northern Territory SA:
South Australia
TAS: Tasmania
VIC: Victoria
WA: Western Australia

group of islands; unable to allocate record to specific island
introduced: introduced by humans
self introduced: natural range extension
? introduced: probably introduced by humans, requires verification
? record: record requires verification
? species: identity of mammal species requires verification
? status: current status requires verification

DATABASE 2: LIST OF ISLANDS

Island name	Juris-dict-ion	Group	Area (ha)	Dist-ance	Channel depth (m)	J?	Art J?	Height (m)	Rain-fall (mm)	Acc. to Abgns?	Well known?
#Claremont (isles)	QLD		0	0.0				0	0		
#Cocos-Keeling (group)	Com	Indian Ocean	1420	1020.0	5000	n			1900	n	y
#Crocodile (group)	NT		0	0.0	0	n		0	1000	y	n
#Duke (group)	QLD		0	0.0				0	0		
#New Year (group)	TAS		0	0.0				0	0		
#Percy (islands)	Qld		0	0.0				0	0		
#Repulse (group)	QLD		0	0.0				0	0		
Actaeon	TAS		13	3.1	<20 (10)	n		2	1000	y	y
Adele	WA		247	69.0	60	n		4		y	y
Albany	QLD	Torres Strait	616	0.5	<20(<10)	n		88	1600	y	n
Albatross	SA	Jussieu Peninsula	7	0.2	<40	n		19	500	n	y
Albatross	TAS	Hunter	24	11.1	55	n		38	1000	y	y
Alger	NT		778	6.0	<20(<10)	n		26	1200	y	n
Alpha	WA	Montebello	86	0.2	<20(<5)	n		39	200	n	n
Althorpe	SA	Althorpe	81	7.6	<30	n		77	400	n	y
Anderson	TAS	Furneaux	148	2.5	<20 (10)	n		60	800	n	y
Angel	WA	Dampier	927	1.0	<20(<10)	n		60	200	y	y
Astell	NT	English Company	1143	3.0	<20	n		70	1200	y	n
Augustus	WA	Bonaparte	19023	1.8	<20	n		178	1200	y	y
Babel	TAS	Furneaux	430	2.6	<20(<10)	n		197	800	n	y
Badger	TAS	Furneaux	1235	11.0	<20 (10)	n		34	800	n	y
Badu (=Mulgrave)	QLD	Torres Strait	10530	1.8	<20(<60	n		198	1600	y	n
Baird	SA	Baird Bay	18	0.7	<20(<10)	n			300	n	y
Bald	WA		72	1.5	<50	n		280	600	n	y
Ballee	WA	Murray Delta	19	0.1	<20(<5)	n			800	y	y
Barrow	WA	Barrow	23590	55.0	<20 (10)	n		60	250	n	y
Bat (Cape Brewster)	WA	Bonaparte	7	0.1	<20	n		0	1200	y	n
Bathurst	NT		164520	1.0	<20 (10)	n		102	1400	y	y
Bathurst	WA	Buccaneer	610	0.5	<20(<10)	n		40	800	y	y
Beaumont	WA	Recherche	32	12.0	36	n		70	500	n	n
Bedford (S island)	WA	Buccaneer	310	4.7	<20	n		57	700	y	n
Bedout	WA		24	38.0	<20 (15)	n		8	200	y	y
Bennison	VIC	Corner Inlet	5	1.8	<20(<6)	y		48	800	y	y
Bentinck	QLD	Wellesley	13800	24.3	<20(<6)	n		21	800	y	n
Bernier	WA	Shark Bay	4267	0.5	<20(<10)	n		52	200	n	y
Big Green	TAS	Furneaux	114	2.5	<20(<10)	n		0	800	n	y
Big, Five Islands	NSW	Five	19	0.5	<20(<5)	n		16	1200	y	y
Big, Smith's Lake	NSW		22	0.1	-	n		36	1200	y	n
Bigge	WA	Bonaparte	17850	2.5	<20	n		138	1200	y	y
Bird Club	SA	Port Augusta	8	0.2	<20(<5)	y		6	300	y	n
Bird, East	SA	Yorke Peninsula	1	0.7	<20	n		0	400	n	y
Black (Craggy)	NT	Pellew	431	4.8	<20(<10)	n		49	800	y	y
Bluebell	WA	Montebello	53	0.2	<20(<5)	n		25	200	n	n
Boigu	QLD	Torres Strait	7130	7.2	<20 (10)	n		0	1600	y	n
Booby	QLD	Torres Strait	6	20.4	10	n		19	1600	y	y
Boodie	WA	Barrow	170	1.0	<20	n		22	200	n	y
Boomerang	WA	Barrow	5	0.2	0	y		5	200	n	y
Boongaree	WA	Bonaparte	4935	0.5	<20	n		239	1200	y	y
Borda	WA	Osborne	728	4.0	<20	n		118	1200	y	y
Boston	SA	Port Lincoln	967	3.8	<20 (10)	n		91	500	n	y
Boullanger	WA	Lancelin-Dongara	3	1.0	<20(<5)	n		10	500	n	y
Bowen	NSW	Jervis Bay	50	0.2	<20(<10)	n	y	38	1000	y	n
Boxer	WA	Recherche	166	5.3	40	n		92	600	n	y
Boydong	QLD		16	19.2	<30	n	n	5	1600	y	n
Bramble Cay	QLD	Torres Strait	7	49.0	<50	n		1	1600	y	y
Brampton	QLD	Cumberland	433	0.3	<20(<5)	n		214	1200	y	n
Breaksea	WA	King George Sd	102	4.1	20	n		100	800	n	y
Breaksea (Middle)	TAS		20	1.2	<20	n		0	1600	y	n

Island name	Juris-dict-ion	Group	Area (ha)	Dist-ance	Channel depth (m)	J?	Art J?	Height (m)	Rain-fall (mm)	Acc. to Abgns?	Well known?
Bremer	NT		1374	3.5	<20(5)	n		29	1200	y	n
Bribie	QLD	Moreton Bay	17500	0.5	<20(<5)	n	y	11	1200	y	y
Brisk	QLD	Palm	48	3.5	<20	n		70	2000	y	n
Broughton	NSW	Broughton	138	2.5	<20	n		89	1200	y	n
Broughton (=Passage)	WA	Recherche	16	6.2	<35(20)	n		27	500	n	n
Browse	WA	Timor Sea	12	147.0	120	n		6	0	y	y
Bruny	TAS		36735	1.3	<20 (15)	n		571	800	y	y
Brush	NSW		35	0.4	<20	n		20	1000	y	n
Buller	WA	Lancelin-Dongara	1	1.5	<20(<5)	n		0	400	n	y
Bumaga	NT	Cunning-ham	333	3.6	<20(<10)	n		20	1200	y	n
Burrup	WA	Dampier	11804	2.0	<20(<5)	y	y	130	200	y	y
Byam Martin	WA	Bonaparte	810	4.1	<20	n		67	1200	y	n
Cabbage Tree	NSW		30	1.5	<20	n		60	1200	y	n
Caffarelli	WA	Buccaneer	230	13.0	<40	n		72	1200	y	y
Campbell	WA	Montebello	40	0.4	<20(<5)	n		22	200	n	n
Cape Barren	TAS	Bass Strait	46220	7.0	<20 (10)	n		687	800	y	y
Carlia	WA	Osborne	450	0.3	<20	n		120	1200	y	y
Carlisle	QLD	Cumberl-land	550	26.8	<20	n		393	1200	y	n
Carnac	WA	Perth	16	3.6	<20(<10)	n		15	800	n	y
Casuarina, South	SA	Kangaroo	9	2.5	<40	n		35	600	n	y
Cat	TAS	Furneaux	41	0.3	<20	n		32	800	n	y
Centre, Pellew	NT	Pellew	9222	0.9	<20 (<3)	n		85	800	y	y
Chalky	TAS	Furneaux	39	5.0	<20(<10)	n		24	800	n	y
Champagny	WA	Bonaparte	1456	6.0	20	n		56	1200	y	y
Charley	WA	Recherche	101	3.2	<30	n		106	600	n	y
Chatham	WA		69	1.0	<30	n		182	1200	n	y
Chinaman	VIC	Westernport	50	0.3	<20(<5)	n		0	800	y	y
Christmas	Com	Indian Ocean	13470	325.5	5000	n		357	2300	n	y
Churchill	VIC	Westernport	45	0.1	<20(<5)	n	y	21	800	y	y
Citadel	VIC	Glennie	20	0.1	<40	n		117	800	y	y
Clarke	TAS	Furneaux	8391	2.0	<20 (10)	n		206	800	n	y
Cliff	QLD		37	6.2	<20(<6)	n	n	23	1200	y	n
Clonmel	VIC	Corner Inlet	140	1.5	<10(<6)	n		0	800	y	n
Cockatoo	WA	Buccaneer	508	5.0	<40	n		131	800	y	n
Conilurus (=Margaret)	WA	Buccaneer	329	0.1	<20(<10)	n		121	800	y	y
Cooper	WA	Recherche	50	11.2	?	n		33	400	n	n
Coringa Cay, Southwest	Com	Coral Sea	13	361.0	200	n		0	1100	n	y
Cotton	NT	English Company	1974	1.5	<20	n		80	1200	y	n
Cranny	WA	Recherche	25	0.8	?	n		29	300	n	n
Cribb	QLD	Moreton Bay	80	0.1	0	y	y	0	1200	y	n
Croker	NT		31000	2.4	<20 (6)	n		59	1200	y	n
Culeenup	WA	Murray Delta	51	0.1	<20(<5)	n		0	800	y	y
Cull (=Gull)	WA	Recherche	46	1.2	<20	n		95	600	n	y
Curtis	QLD		56345	0.2	<10	n		173	800	y	n
Dangerous Reef	SA	Sir Joseph Banks	2	15.8	<20	n		13	400	n	y
Darcy (=North Heywood)	WA	Bonaparte	4945	3.6	20	n		86	1200	y	y
Darnley	QLD	Torres Strait	543	66.0	20	n		181	1600	y	n
Daw	WA	Recherche	212	32.0	?55	n		141	400	n	y
De Witt	TAS	Maatsuyker	518	5.7	30	n		300	1200	y	y
Deal	TAS	Kent	1722	58.8	45	n		270	800	n	y
Deliverance	QLD	Torres Strait	36	32.0	<10(<6)	n		2	1600	y	n
Denham	QLD	Wellesley	3034	0.3	<20(<10)	n		12	1100	y	n
Dent	QLD	Whitsunday	338	0.8	<20	n		159	1200	y	n
Depuch	WA		1121	2.5	<20(<5)	n		157	200	y	y
Dirk Hartog	WA	Shark Bay	58640	1.5	<20(<6)	n		188	200	n	y
Dixon	WA		495	0.8	<20(<5)	n		33	200	y	n
Djeegaree	NT	Wessel	290	0.3	<20	n		25	1200	y	n
Dog	SA	Nuyts	37	2.3	20	n		60	300	n	y
Dog	VIC	Corner Inlet	140	0.4	<20(<10)	y		0	800	y	y
Dolphin	WA	Dampier	3281	0.2	<20(<5)	n		115	200	y	y
Dorre	WA	Shark Bay	5163	25.0	<20	n		49	200	n	y
Doughboy	TAS	Furneaux	16	1.4	<10(<6)	n		0	800	n	n
Doughboy	VIC	Corner Inlet	2	3.8	<20(<6)	n		24	800	y	y

Island name	Juris-dict-ion	Group	Area (ha)	Dist-ance	Channel depth (m)	J?	Art J?	Height (m)	Rain-fall (mm)	Acc. to Abgns?	Well known?
Douglas	WA	Recherche	30	5.3	55	n		51	500	n	y
Draper	WA	Recherche	15	12.5	36	n		65	500	n	n
Drum	VIC	Corner Inlet	79	0.3	<20(<10)	n		0	8000	y	y
Drysdale	NT		5450	8.1	<20(<10)	n		2	1200	y	n
Dunk	QLD		650	3.9	<20(<10)	n		241	2400	y	y
East Beagle	WA	Lancelin-Dongara	2	8.2	<20(<5)	n		8	400	n	y
East Doubtful	WA	Doubtful	13	0.1	<30	n		60	600	n	y
East Intercourse	WA	Dampier	300	1.2	<20(<5)	n	y	51	200	y	n
East Kangaroo	TAS	Furneaux	147	9.0	<30	n		28	800	n	y
East Lewis	WA	Dampier	1018	1.0	<20(<10)	n		44	200	y	y
East Sister	TAS	Furneaux	519	4.0	20	n		185	800	n	y
East Wallabi	WA	Abrolhos	307	1.5	<20(<5)	n		15	400	n	y
Eba	SA	Streaky Bay	91	0.7	<20(<5)	n		28	300	n	y
Eclipse (near Albany)	WA		104	6.2	50	n		80800	n	y	
Elcho	NT		26950	0.6	<20(<6)	n		44	1200	y	y
Elizabeth	VIC	Westernport	22	0.6	<20(<5)	n		16	800	y	y
Enderby	WA	Dampier	3190	8.1	<20(<10)	n		40	200	y	y
English	SA	Sir Joseph Banks	4	1.2	20	n		5	400	n	y
Erith-Dover	TAS	Kent	678	1.2	<40	n		237	800	n	y
Eyre	SA	Nuyts	984	1.8	<20(<2)	n		8	300	n	y
Facing	QLD		2742	1.1	<20(<5)	n		60	800	y	n
Fairfax	QLD	Bunker	21	70.0	<40	n		0	1000	y	y
Fantome	QLD	Palm	635	0.2	<20	n		218	2000	y	n
Faure	WA	Shark Bay	5148	6.1	<20(<6)	n		26	200	n	n
Fenelon	SA	Nuyts	81	1.2	<20	n		58	300	n	y
Figure of Eight	WA	Recherche	248	13.0	40	n		112	600	n	y
Finger	WA	Recherche	8	7.8	36	n		45	500	n	n
Fisher	TAS	Furneaux	1	0.2	<20(<5)	n		0	800	n	y
Fitzroy	QLD		325	4.3	20	n		270	2700	y	n
Flat Witch	TAS	Maatsuyker	65	1.6	<20	n		100	1200	y	y
Flinders	QLD	Flinders	1480	7.4	<20(<10)	n		318	1200	y	n
Flinders	SA	Investigator	3642	28.5	40	n		59	300	n	y
Flinders	TAS	Furneaux	134720	53.0	<30	n		756	800	n	y
Franklin	SA	Nuyts	512	13.5	<30	n		20	300	n	y
Fraser	QLD		165400	1.1	<20(<6)	n		244	1200	y	y
Freeling	SA	Nuyts	8	0.7	<20	n		35	300	n	y
French	VIC	Westernport	17470	2.4	<20(<5)	n		98	1000	y	y
Friday	QLD	Torres Strait	500	0.9	<20(<6)	n		106	1600	y	n
Gabo	VIC		150	0.5	<20	n		40	800	y	y
Garden	WA	Perth	1054	2.3	<20(<5)	n	y	55	800	n	y
George Rocks	TAS	Bass Strait	2	2.8	<20 (10)	n		20	800	n	y
Germein	SA	Venus Bay	173	2.8	<20(<5)	n		12	300	n	y
Gibbings	WA	Buccaneer	289	4.1	<20	n		94	800	y	y
Gidley	WA	Dampier	798	0.2	<20(<10)	n		57	200	y	y
Glennie	WA	Recherche	40	4.6	36	n		29	500	n	y
Gloucester	QLD		2484	0.1	<20(<5)	n		566	1200	y	n
Goat	SA	Nuyts	285	1.5	<20(<5)	n		40	300	n	y
Goose	SA	Wardang	6	0.5	<20(<10)	n		27	400	n	y
Goose	TAS	Furneaux	81	2.9	20	n		20	800	n	y
Goose	WA	Recherche	56	0.6	<20(<5)	n		47	500	n	y
Graham	NT		784	1.8	<20(<10)	n		5	1200	y	n
Granite	SA	Encounter Bay	32	0.7	<20(<10)	n	y	34	500	n	y
Grassy	QLD		111	1.3	<20(<10)	n		149	1200	y	n
Great Dog	TAS	Furneaux	377	1.7	<20(<10)	n		27	800	n	y
Great Glennie	VIC	Glennie	119	7.8	<70	n		136	800	y	y
Great Palm	QLD	Palm	5590	26.0	20	n		500	2000	y	n
Green	SA	Yorke Peninsula	2	0.9	<20(<5)	n		0	400	n	y
Green (near Cairns)	QLD		15	12.7	<40(30)	n	n	24	2000	y	n
Green Islet, North	WA	Lancelin-Dongara	2	0.1	<20(<5)	n		8	500	n	y
Green Islet, South	WA	Lancelin-Dongara	8	3.1	<20(<5)	n		8	500	n	y
Greenly	SA		141	29.0	<70	n		230	500	n	y
Griffiths	VIC		33	0.1	<20(<5)	n	y	20	800	y	y
Groote Eylandt	NT		225820	39.0	<20	n		140	1000	y	y
Guluwuru	NT	Wessel	7625	1.5	<20(<10)	n		45	1200	y	n
Hamilton	QLD	Whitsunday	603	1.1	<20	n		230	1200	y	n

Island name	Juris-dict-ion	Group	Area (ha)	Dist-ance	Channel depth (m)	J?	Art J?	Height (m)	Rain-fall (mm)	Acc. to Abgns?	Well known?
Hareby	SA	Sir Joseph Banks	46	1.2	<20(<5)	n		15	400	n	y
Haslewood	QLD	Whitsunday	720	0.7	<20	n		151	1200	y	n
Hauloff Rock	WA		25	1.5	?	n		80	600	n	n
Hauy	WA	Dampier	110	1.2	<20	n		17	200	y	y
Hayman	QLD	Whitsunday	321	1.4	<20(<10)	n		250	800	y	n
Heard	Com	Sub-Antarctic	37500	400.0	2000	n		2745	0	n	y
Henning	QLD	Whitsunday	38	1.1	<20	n		67	1200	y	n
Hermite	WA	Montebello	836	20.0	<20(<5)	n		30	00	n	y
Heron	QLD	Capricorn	13	25.7	<40	n		18	1000	y	y
Hidden	WA	Buccaneer	1974	0.1	<20	n		127	800	y	y
Hinchinbrook	QLD		31756	1.0	<20(<5)	n		922	2000	y	y
Hindmarsh	SA	Murray Delta	5860	0.3	<20(<10)	n		33	400	y	n
Hippolyte	TAS		5	3.7	80	n		66	800	y	y
Hogan	TAS	Hogan	239	39.0	55	n		131	800	n	y
Hood	WA	Recherche	96	3.5	? <50	n		76	600	n	y
Hook	QLD	Whitsunday	6161	0.4	<20	n		459	1200	y	n
Hopkins	SA	Jussieu Peninsula	112	1.3	<20(<10)	n		70	500	n	y
Horn	QLD	Torres Strait	5380	1.8	<20(<6)	n		122	1600	y	
Hoskyn, North	QLD	Bunker	2	0.8	36	n		0	1000	y	n
Hoskyn, South	QLD	Bunker	5	10.0	36	n		0	1000	y	n
Howick	QLD		446	13.5	<20(>15)	n	n	56	1200	y	n
Hummock	VIC	Corner Inlet	313	0.9	<10(<6)	n		0	800	y	n
Hunter	TAS	Hunter	7182	4.7	20	n		90	1000	y	y
Ile du Golfe	TAS		70	3.7	20	n		80	1200	y	y
Indian	NT		2781	0.6	<20(<10)	n		21	1400	y	n
Inglis	NT	English Company	8830	2.1	<20	n		129	1200	y	n
Irvine	WA	Buccaneer	967	13.0	<40	n		145	800	y	y
Jeegarnyeejip	WA	Murray Delta	15	0.1	<20(<5)	n		0	800	y	y
Jennala	WA	Murray Delta	7	0.1	<20(<5)	n		0	800	y	y
Jirrgarri	NT	Cunning-ham	701	0.9	<20(<5)	n		35	1200	y	n
Judgement Rocks	TAS	Kent	2	0.9	55	n		32	800	n	y
Kangaroo	SA		450000	14.1	20	n		300	600	n	y
Kanowna	VIC	Anser	32	1.1	<50	n		95	800	y	y
Katers	WA	Bonaparte	1775	2.2	<20	n		104	1200	y	y
Keast	WA	Dampier	40	1.5	<20(<5)	n		6	200	y	y
Kendrew	WA	Dampier	6	3.0	<20(<5)	n		9	200	y	y
Kermadec (= Wedge)	WA	Recherche	24	8.5	55	n		79	500	n	y
King	TAS	Bass Strait	110000	86.0	45	n		143	1000	n	y
King Hall	WA	Buccaneer	209	0.3	<20	n		91	800	y	y
Kingfisher (=N Wood)	WA	Kingfisher	1017	15.5	<20	n		82	800	y	y
Koolan	WA	Buccaneer	2712	0.6	20	n		186	800	y	n
Labu	NT	Pellew	40	0.9	<20(<2)	n		9	800	y	n
Lachlan	WA	Buccaneer	1296	0.2	<20(<5)	n		93	700	y	y
Lacy	SA	Nuyts	113	8.9	30	n		45	300	n	y
Lady Elliott	QLD	Great Barrier Reef	37	77.3	<40	n		0	1000	y	y
Lady Julia Percy	VIC		149	8.1	<30	n		40	800	y	y
Lady Musgrave	QLD	Bunker	9	5.8	<40	n		2	1000	y	y
Legendre	WA	Dampier	1286	2.8	<20(<10)	n		36	200	y	y
Leo	WA	Abrolhos	21	7.4	20	n		0	400	n	y
Lewis	SA	Jussieu Peninsula	11	2.0	<20 (10)	n		44	500	n	y
Libke (nr MacKenzie)	WA	Recherche	24	2.3		n		55	600	n	n
Liguanea	SA	Cape Carnot	129	4.0	<50	n		46	500	n	y
Lindeman	QLD	Cumber-land	610	1.0	<20	n		212	1200	y	n
Lingnoonganee	QLD	Wellesley	1103	0.3	<20(<6)	n		23	1100	y	n
Lion	NSW	Broken Bay	8	0.5	<20(<10)	n		87	1200	y	y
Lion	WA	Recherche	11	2.5	<20	n		52	600	n	y
Little (adj. Lewis)	SA	Jussieu Peninsula	2	0.6	<20 (10)	n		8	500	n	y

Island name	Jurisdiction	Group	Area (ha)	Distance	Channel depth (m)	J?	Art J?	Height (m)	Rainfall (mm)	Acc. to Abgns?	Well known?
Little Boydong	QLD		3	0.7	<30	n		1	1600	y	n
Little Broughton	NSW	Broughton	36	0.2	<20	n		102	1200	y	n
Little Dog	TAS	Furneaux	65	1.2	<20(<10)	n		36	800	n	y
Little Dog	VIC	Corner Inlet	72	0.2	<20(<6)	y		0	800	y	n
Little Goose	SA	Wardang	2	0.3	<20(<10)	n		0	400	n	y
Little Green	TAS	Furneaux	92	0.8	<20(<10)	n		0	800	n	y
Little Snake	VIC	Corner Inlet	486	1.5	<20(<6)	n		0	800	y	n
Little Yunderup	WA	Murray Delta	1	0.1	<20(<5)	n		0	800	y	y
Lizard	QLD		850	28.8	20	n		359	1600	y	n
Long	QLD	Whitsunday	987	0.5	<10	n		270	1200	y	n
Long	TAS	Furneaux	307	0.8	<20(<10)	n		50	800	n	y
Long	WA	Buccaneer	1356	9.3	20	n		65	700	y	y
Lord Howe	NSW		1455	620.0	1000	n		875	1700	n	y
Louisa	TAS		21	0.3	<20	y		20	1200	y	y
Lounds	SA	Nuyts	7	8.6	~20	n		10	300	n	y
Maatsuyker	TAS	Maatsuyker	176	6.4	40	n		260	1200	y	y
Mabuiag (= Jervis)	QLD	Torres Strait	570	9.5	10	n		116	1600	y	n
MacKenzie (= Round)	WA	Recherche	48	6.5	? <50	n		28	600	n	y
Macquarie	TAS	Sub-Antarctic	11800	660.0	3000	n		422	900	n	y
Maer (=Mer, Murray Is)	QLD	Torres Strait	390	45.6	20	n		95	1600	y	n
Magnetic	QLD		5212	4.5	<20(<5)	n		506	1200	y	n
Mai (adj. Albany)	QLD	Torres Strait	18	0.6	<20(<10)	n		52	1600	y	n
Malus	WA	Dampier	317	2.5	<20(<10)	n		34	200	y	y
Marchinbar	NT	Wessel	21190	18.3	<20(<5)	n		74	1200	y	n
Maria	NT		3729	14.4	<20(6)	n		64	800	y	y
Maria	TAS		10401	4.0	<20	n		709	800	y	y
Masillon	SA	Nuyts	202	3.2	<30	n		76	300	n	y
Meeyip	WA	Murray Delta	7	0.1	<20(<5)	n		0	800	y	y
Melomys (=M Wood)	WA	Kingfisher	678	1.0	<20	n		86	800	y	y
Melville	NT		573000	22.5	<20 (10)	n		123	1400	y	y
Michaelmas	WA	King George Sd	93	2.2	<20(<10)	n		100	800	n	y
Middle (Abrolhos)	WA	Abrolhos	19	6.3	<20(<5)	n		2	400	n	y
Middle (Recherche)	WA	Recherche	1036	8.1	30	n		165	500	n	y
Middle (near Barrow)	WA	Barrow	350	0.2	<20	n		18	200	n	y
Middle Doubtful	WA	Doubtful	58	2.5	<30	n		40	600	n	y
Middle Lacepede	WA	Lacepede	42	0.2	<20(<5)	n		2	600	y	y
Middle Mangrove	WA	Mangrove	113	6.0	<20(<5)	n		6	200	n	y
Middle Osborne	WA	Osborne	2252	2.3	<20	n		216	1200	y	y
Middle Percy	QLD	Northumberland	1969	54.0	<30	n		247	1200	y	n
Milingimbi	NT	Crocodile	5236	0.5	<20(<5)	n		20	1000	y	n
Mistaken	WA	King George Sd	10	0.2	<20(<5)	y		44	800	y	y
Moa	QLD	Banks	17441	39.5	10	n		374	1600	y	n
Mondrain	WA	Recherche	810	11.5	36	n		222	600	n	y
Montagu	NSW		49	6.8	30	n		64	800	y	n
Moreton	QLD	Moreton Bay	17021	3.5	<20(<5)	n		280	1200	y	y
Moriarty Rocks	TAS	Furneaux	3	6.1	<20	n		8	800	n	y
Morley	WA	Abrolhos	7	0.2	<20	n		0	400	n	y
Mornington	QLD	Wellesley	97020	25.8	<20(<6)	n		42	1100	y	n
Mount Adolphus	QLD	Torres Strait	674	10.4	<20 (15)	n		178	1600	y	n
Mount Chappell	TAS	Furneaux	341	1.5	<20(<10)	n		198	800	n	y
Mt Dutton Bay (SW)	SA	Coffin Bay	3	0.1	<20(<5)	y		0	500	y	n
Mud	VIC	Port Phillip Bay	60	5.8	<20(<5)	n		2	800	y	y
Mungary (Island Pt)	SA	Yorke Peninsula	3	0.1	<20(<5)	y		0	400	y	n
Mutton Bird	NSW		8	0.1	<20	n	y	45	1200	y	n
New Year	TAS	Bass Strait	85	4.5	<20(<10)	n		27	1000	n	y
New Year	WA	Recherche	19	0.2	?	n		32	400	n	n
Newry	QLD		51	0.2	<10(<2)	n		75	1200	y	n
Night	QLD		61	5.7	<20(<15)	n	n	14	1200	y	n
Ninth	TAS	Bass Strait	20	11.7	<30 (20)	n		33	800	n	y

Island name	Juris-dict-ion	Group	Area (ha)	Dist-ance	Channel depth (m)	J? Art J?	Height (m)	Rain-fall (mm)	Acc. to Abgns?	Well known?
Nook	WA	Recherche	30	11.8	?	n	20	300	n	n
Norfolk	Com	Pacific Ocean	3450	767.0	1000	n	317	1300	n	y
North (Abrolhos)	WA	Abrolhos	176	18.0	10	n	11	400	n	y
North (Gambier)	SA	Gambier	66	2.1	<20	n	40	500	n	y
North Bickers	SA	Port Lincoln	6	1.4	<20(<5)	n	9	500	n	y
North Coronation	WA	Bonaparte	4038	6.0	<20	n	151	1200	y	n
North Double	WA	Barrow	12	1.8	<20(<5)	n	16	200	n	y
North East	NT	Groote	375	12.5	<20(<10)	n	63	1200	y	n
North East Percy	QLD	Northumberland	217	2.5	<30	n	138	1200	y	n
North Fisherman	WA	Lancelin-Dongara	1	5.9	<20(<5)	n	10	400	n	y
North Gidley	WA	Dampier	259	0.2	<20(<10)	n	32	200	y	y
North Goulburn	NT	Goulburn	4158	4.5	<20(10)	n	26	1000	y	n
North Keppel	QLD	Keppel	436	13.0	<20(<10)	n	130	800	y	y
North Malus	WA	Dampier	11	0.3	<20(<10)	n	2	200	y	y
North Molle	QLD	Whitsunday	219	1.5	<20(<10)	n	231	1200	y	n
North Neptune, West I	SA	Neptune	170	21.0	<90	n	48	400	n	y
North Peron	NT	Peron	1766	4.5	<20(<5)	n	25	1400	y	n
North Reef	QLD	Capricorn	2	22.5	<50	n	0	1000	y	y
North Stradbroke	QLD	Moreton Bay	26344	3.8	<20(<5)	n	219	1200	y	y
North Twin Peak	WA	Recherche	272	8.2	<20 (16)	n	180	500	n	y
North, Pellew	NT	Pellew	5778	2.1	<20(<6)	n	76	800	y	y
Northwest	QLD	Capricorn	108	51.9	<40	n	15	1000	y	y
Northwest	WA	Montebello	106	1.2	<20(<5)	n	23	200	n	n
Olive	SA	Cape Bauer	16	8.3	20	n	30	300	n	y
One Tree	QLD	Capricorn	5	19.9	<40	n	0	1000	y	y
Orpheus	QLD	Palm	1160	7.7	<20	n	160	2000	y	n
Outer Newry	QLD		49	0.3	<10(<2)	n	49	1200	y	n
Partney	SA	Sir Joseph Banks	38	1.8	<20(<10)	n	9	400	n	y
Pasco	WA	Barrow	2	0.5	<20(<5)	n	18	200	n	y
Pasley	WA	Recherche	54	7.0	?	n	20	400	n	n
Pearson, north	SA	Investigator	164	25.0	70	n	231	300	n	y
Pearson, south	SA	Investigator	39	0.1	?<20	n	100	300	n	y
Pedra Branca	TAS		3	26.0	130	n	60	1000	y	y
Pelorus	QLD	Palm	339	0.9	<20(<15)	n	260	2000	y	n
Pelsaert	WA	Abrolhos	120	57.0	30	n	4	400	n	y
Penguin	WA	Shoalwater	12	0.5	<20(<5)	y	18	800	y	y
Perforated	SA	Whidbey	58	14.9	30	n	72	500	n	y
Phillip	Com	Norfolk	224	6.0	1000	n	100	1300	n	y
Phillip	VIC	Westernport	10116	0.5	<20(<5)	n y	68	800	y	y
Pigeon	WA	Abrolhos	3	0.8	<20(<5)	n	0	400	n	y
Possession	QLD	Torres Strait	520	1.8	<20(<6)	n	66	1600	y	n
Preservation	TAS	Furneaux	198	1.4	<20(<10)	n	15	800	n	y
Prime Seal	TAS	Furneaux	1219	6.5	<20 (10)	n	174	800	n	y
Primrose	WA	Montebello	35	0.2	<20(<5)	n	25	200	n	n
Prince of Wales	QLD	Torres Strait	19646	14.4	<10	n	247	1600	y	n
Purdie	SA	Nuyts	14	6.9	<20	n	25	300	n	y
Quail	VIC	Westernport	480	0.2	<20(<5)	n	20	800	y	n
Rabama (= Yabooma?)	NT	Crocodile	2653	3.0	<20(<5)	n	20	1000	y	n
Rabbit	QLD		312	2.9	<20(<2)	n	95	1200	y	n
Rabbit	SA	Port Lincoln	15	2.8	<20(<10)	n	10	500	n	y
Rabbit	VIC	Wilsons Promontory	26	2.1	<20(<10)	n	59	800	y	y
Rabbit Rock	VIC	Wilsons Promontory	1	0.2	<20(<10)	n	15	800	y	y
Raine	QLD	Great Barrier Reef	30	86.1	<200	n	3	0	y	y
Raragala	NT	Wessel	9232	0.2	<20	n	59	1200	y	n
Rat	WA	Abrolhos	56	26.5	30	n	4	400	n	y
Raymond, Lake Victoria	VIC	Gippsland Lakes	769	0.1	0	n	0	600	y	n
Reevesby	SA	Sir Joseph Banks	373	12.4	<20	n	33	400	n	y
Reid Rocks	TAS	Bass Strait	9	21.9	45	n	12	1000	n	y
Rimbija	NT	Wessel	211	0.6	<20(<5)	n	20	1200	y	n
Robbins	TAS	Hunter	9835	1.0	<20(<5)	n	63	1000	y	y

Island name	Juris-dict-ion	Group	Area (ha)	Dist-ance	Channel depth (m)	J?	Art J?	Height (m)	Rain-fall (mm)	Acc. to Abgns?	Well known?
Rocky	QLD	Wellesley	38	14.1	<40 (20)	n		13	1100	y	y
Rocky	WA		30	19.5	55	n		0	600	n	n
Rocky (S of Greenly)	SA		12	18.8	<80	n		68	500	n	y
Rodd	NSW	Sydney Harbour	1	0.1	<20(<5)	n		0	1200	y	n
Rosemary	WA	Dampier	1152	8.4	20 ?<10	n		60	200	y	y
Rotamah, Lake Victoria	VIC	Gippsland Lakes	340	0.1	0	y	y	0	600	y	y
Rottnest	WA	Perth	1705	18.0	<20(<10)	n		30	800	n	y
Round (not MacKenzie)	WA	Recherche	32	33.0	? 73	n		20	400	n	n
Russell	QLD	Moreton Bay	1748	0.2	<20(<5)	n		20	1200	y	n
Saddleback	QLD		53	1.0	<10	n		143	1200	y	n
Saibai	QLD	Torres Strait	10379	3.6	<20(<10)	n		0	1600	y	n
Saint Andrew	WA	Bonaparte	1525	2.0	<20	n		288	1200	y	y
Saint Bees	QLD	Cumber-land	987	37.7	20	n		377	1200	y	n
Saint Francis	SA	Nuyts	809	31.6	30	n		81	300	n	y
Saint Helens	TAS		51	1.8	<40	n		20	800	n	y
Saint Margaret	VIC	Corner Inlet	1934	0.2	<20(<6)	n		0	800	y	n
Saint Peter	SA	Nuyts	3731	3.5	<20(<5)	n		44	300	n	y
Salisbury	WA	Recherche	368	41.2	73	n		128	400	n	y
Salutation	WA	Shark Bay	162	4.2	<20(<6)	n		19	200	y	y
Sandland	WA	Lancelin-Dongara	1	0.3	<20(<5)	n		0	500	n	y
Sandy (Lacepede Is)	WA	Lacepede	6	3.6	<20(<5)	n		4	600	y	y
Schouten	TAS		2681	1.0	<20	n		360	600	y	n
Seaforth	QLD	Cumbe-land	21	0.6	<10	n		50	1200	y	n
Seal	VIC	Seal	18	19.2	<30	n		46	800	y	y
Seal Rock	WA	Recherche	5	2.3	40	n		12	600	n	y
Seal Rocks	NSW		1	2.6	30	n		11	1200	y	y
Seal Rocks	VIC	Westernport	1	1.6	20	n		0	800	y	y
Serrurier (=Long)	WA		274	20.0	20(<10)	n		14	200	n	n
Simpson	WA	Exmouth Gf	78	1.5	20(<5)	n		9	200	n	y
Sims	NT	Goulburn	42	2.7	20(<10)	n		14	1000	y	n
Sir Frederick	WA	Buccaneer	389	2.1	20	n		60	800	y	y
Sir Graham Moore	WA	SirGraham Moore	2774	3.0	<20	n		56	1000	y	y
Six Mile (Pt Dempster)	WA	Recherche	10	8.0	< ?36	n		1	400	n	y
Skull	NT	Pellew	635	1.2	<20(<6)	n		48	800	y	y
Slope	WA	Shark Bay	1	2.1	<20(<2)	n	y	0	200	n	y
Sloping	TAS		108	1.4	<20(<5)	n		70	800	y	y
Snake	VIC	Corner Inlet	4623	2.7	<20(<6)	n		0	800	y	y
Snapper	NSW	Sydney Harbour	1	0.1	<20(<10)	n		0	1200	y	n
South Cervantes	WA	Lancelin-Dongara	1	0.6	<20(<5)	n		8	500	n	y
South Double	WA	Barrow	23	1.6	<20	n		11	200	n	y
South East (Montbello)	WA	Montebello	13	0.8	<20(<5)	n		24	200	n	n
South Heywood	WA	Bonaparte	768	0.3	<20	n		53	1200	y	y
South Mangrove	WA	Mangrove	29	1.5	<20(<5)	n		35	200	n	y
South Molle	QLD	Whitsunday	380	2.6	20	n		195	1200	y	n
South Mount Dutton	SA	Coffin Bay	1	0.4	<20(<2)	n		0	500	n	y
South Neptune, North I	SA	Neptune	51	10.8	<90	n		35	400	n	y
South Neptune, South I	SA	Neptune	45	0.3	<10	n		54	400	n	y
South Percy	QLD	Northumb-erland	1280	7.3	<30	n		193	1200	y	n
South Peron	NT	Peron	485	2.4	<20(<5)	n		7	1400	y	n
South Solitary	NSW	Solitary	10	7.5	<40	n		66	1200	y	n
South West Osborne	WA	Osborne	1326	2.9	<20	n		136	1200	y	y
South West, Pellew	NT	Pellew	9517	0.2	<20(<2)	n		93	800	y	y
Southport	TAS		7	0.4	<20	n		27	1000	y	y
Spilsby	SA	Sir Joseph Banks	405	26.0	<20(<10)	n		41	400	n	y
Stanley	QLD	Flinders	870	1.0	<20(<10)	n		111	1200	y	n
Sterile	TAS		4	1.8	<20 (10)	n		8	1000	y	y
Stick (=Jubilee)	WA	Abrolhos	2	1.8	<20(<5)	n		2	400	n	y
Stickney	SA	Sir Joseph Banks	56	5.0	<20(<10)	n		30	400	n	y

Island name	Juris-dict-ion	Group	Area (ha)	Dist-ance	Channel depth (m)	J? Art J?	Height (m)	Rain-fall (mm)	Acc. to Abgns?	Well known?
Sugarloaf Rock	WA		1	0.1	<20	n	42	800	n	y
Sunday	VIC	Corner Inlet	1034	2.1	<20(<10)	n	0	800	y	n
Sunday	WA	Buccaneer	1157	8.1	20	n	62	700	y	y
Swan	TAS	Bass Strait	210	3.0	<20	n	20	800	n	y
Swan	VIC	Port Phillip Bay	247	0.6	<20(<5)	n y	20	600	y	n
Sweers	QLD	Wellesley	1219	2.4	<20(<6)	n	28	800	y	n
Sydney	QLD	Wellesley	1026	0.9	<20(<6)	n	22	1100	y	n
Tasman	TAS		120	0.3	<20	n	238	800	y	y
Tasmania	TAS		620-0000	210.0	55	n	1617	3200	y	y
Taylor	SA	Jussieu Peninsula	255	2.8	<20 (10)	n	60	500	n	y
Taylor	WA	Recherche	22	1.7	<20(10)	n	45	500	n	n
Tenth	TAS	Bass Strait	1	4.8	20	n	9	800	n	y
Termination	WA	Recherche	52	32.9	73	n	105	500	n	y
The Brothers	SA	Coffin Bay	1	1.2	<20(<5)	n	0	500	n	y
The Needles	TAS	Maatsuyker	6	0.5	<20	n	0	1200	y	y
The Pages (N islet)	SA	Kangaroo	16	13.1	20	n	24	500	n	y
The Skerries	VIC		1	0.5	<20	n	13	800	y	y
The Thumbs	TAS		1	0.1	<20	n	25	800	y	y
Thevenard	WA		708	20.8	<20 (10)	n	14	200	n	y
Thistle	SA	Jussieu Peninsula	4113	7.8	<20	n	210	500	n	y
Thomas	WA	Recherche	52	0.8	30	n	60	600	n	y
Three Bays	WA	Shark Bay	5	1.1	<20(<6)	n	15	200	n	y
Three Hummock	TAS	Hunter	7110	3.9	20	n	237	1000	y	y
Tollgate	NSW	BatemansBy	5	3.2	20	n	48	800	y	n
Tozer	WA	Dampier	15	0.3	20(<5)	y	14	200	y	y
Trefoil	TAS	Hunter	140	2.0	20(<10)	n	84	1000	y	y
Trimouille	WA	Montebello	450	3.4	20	n	43	200	n	y
Troubridge	SA	Yorke Peninsula	9	6.0	20(<2)	n	24	400	n	y
Truant	NT		269	21.0	35	n	46	1200	y	n
Tumby	SA	Tumby Bay	26	0.7	<20(<5)	n	12	400	n	y
Uwins	WA	Bonaparte	3240	0.2	<20	n	130	1200	y	n
Vanderlin	NT	Pellew	27690	6.0	<20(<6)	n	84	800	y	y
Vansittart	TAS	Furneaux	765	0.9	<20(<10)	n	166	800	n	y
Venus Bay, island A N	SA	Venus Bay	17	2.1	<20(<5)	n	0	300	n	y
Venus Bay, island B S	SA	Venus Bay	6	0.8	<20(<5)	n	0	300	n	y
Venus Bay, island C E	SA	Venus Bay	13	1.0	<20(<5)	n	0	300	n	y
Waldegrave	SA	Investigator	335	2.7	<20(<5)	n	37	300	n	y
Walker	TAS	Hunter	634	0.3	<20(<5)	n	20	1000	y	y
Wardang	SA	Yorke Peninsula	1756	3.8	<20	n	23	400	n	y
Warnawi	NT	Cunning-ham	194	3.3	20	n	20	800	y	n
Waterhouse	TAS	Bass Strait	293	3.0	<20(<10)	n	40	800	n	y
Watson	NT	Pellew	1322	0.6	<20(<10)	n	45	800	y	y
Wedge	SA	Gambier	967	24.3	40	n	206	500	n	y
Wedge	WA	Lancelin-Dongara	2	0.2	<20(<5)	y	19	500	y	y
Weld	WA		39	2.1	<20(<6)	n	4	200	n	y
West	SA	Encounter Bay	14	0.8	<20	n	40	500	n	y
West	WA	Recherche	30	14.6	55	n	0	500	n	n
West Intercourse	WA	Dampier	2300	0.1	<20(<5)	n	71	200	y	n
West Lacepede	WA	Lacepede	82	30.1	<20 (10)	n	2	600	y	y
West Lewis	WA	Dampier	1974	2.5	<20(<10)	n	100	200	y	y
West Moncoeur	TAS	Bass Strait	14	9.3	55	n	97	800	n	y
West Sister	TAS	Furneaux	714	2.0	20	n	159	800	n	y
West Wallabi	WA	Abrolhos	587	60.0	30	n	15	400	n	y
West, Sir Ed Pellew	NT	Pellew	13373	3.6	<20(<6)	n	53	800	y	y
Westall (= Combe)	WA	Recherche	70	13.8	55	n	22	500	n	y
Whitlock	WA	Lancelin-Dongara	5	0.4	<20(<1)	y	9	500	n	y
Whitsunday	QLD	Whitsunday	10526	10.3	20	n	435	1200	y	n
Wickham (= Stanley)	WA	Recherche	43	2.7	<35(20)	n	15	500	n	n

Island name	Juris-dict-ion	Group	Area (ha)	Dist-ance	Channel depth (m)	J? Art J?	Height (m)	Rain-fall (mm)	Acc. to Abgns?	Well known?
Wigram	NT	English Company	2061	9.9	<20	n	64	1200	y	n
Williams	SA	Jussieu Peninsula	158	1.9	<30	n	40	500	n	y
Wilson	WA	Recherche	90	5.0	? <50	n	78	600	n	n
Wollaston	WA	Bonaparte	798	1.2	<20	n	178	1200	y	y
Wooded	WA	Abrolhos	14	3.6	<20	n	0	400	n	y
Woody	QLD		563	3.7	<10?	n	60	1000	y	n
Woody	WA	Recherche	108	5.6	30	n	127	600	n	y
Worallgarook	WA	Murray Delta	8	0.1	<20(<5)	n	0	800	y	y
Wreck	QLD	Capricorn	4	12.6	36	n	12	1000	y	y
Wright	SA	Encounter Bay	2	0.7	<20(<10)	n	24	500	n	y
Yam (= Turtle-backed)	QLD	Torres Strait	150	11.7	<20 (10)	n	66	1600	y	n
Yangie Bay	SA	Coffin Bay	6	0.1	<20(<5)	y	0	500	y	n
Yunderup	WA	Murray Delta	8	0.1	<20(<5)	n	0	800	y	y

J? Art J? = joined or artificially joined to the mainland.

DATABASE 3A: LIST OF MAMMALS BY COMMON NAME

NAME	F WT	MABW	M WT	CWR	DIET	STATUS
Echidna, *Tachyglossus aculeatus*		4000		y	c	
Platypus, *Ornithorhynchus anatinus*	1520	1328	1135	y	c	
Thylacine, *Thylacinus cynocephalus*		25000			c	ex
Mardo, Yellow-footed Antechinus, *Antechinus flavipes*	56	45	34	y	c	
Swamp Antechinus, *Antechinus minimus*	65	54	42	y	c	
Dusky Antechinus, *Antechinus swainsonii*	65	53	41	y	c	
Little Red Antechinus, *Dasykaluta rosamondae*	35	30	25		c	
Northern Quoll, *Dasyurus hallucatus*	650	525	400	y	c	
Spotted-tailed Quoll, *Dasyurus maculatus*	6000	4500	3000	y	c	
Eastern Quoll, *Dasyurus viverrinus*	1300	1090	880	y	c	v
Pilbara Ningaui, *Ningaui timealeyi*		8			c	
Dibbler, *Parantechinus apicalis*	80	70	60	y	c	e
Sandstone Antechinus, *Parantechinus bilarni*	40	35	30	y	c	
Brush-tailed Phascogale, *Phascogale tapoatafa*	200	175	145	y	c	
Long-tailed Planigale, *Planigale ingrami*	6	6	6		c	
Common Planigale, *Planigale maculata*	12	11	10		c	
Fat-tailed Antechinus, *Pseudantechinus macdonnellensis*		25			c	
Carpentarian Antechinus, *Pseudantechinus mimulus*		16			c	
Ningbing Antechinus, *Pseudantechinus ningbing*	18	20	22		c	
Tasmanian Devil, *Sarcophilus harrisii*	8000	7000	6000		c	
Kangaroo Island Dunnart, *Sminthopsis aitkeni*					c	
Carpentarian Dunnart, *Sminthopsis butleri*		28			c	
Little Long-tailed Dunnart, *Sminthopsis dolichura*	14	14	13		c	
Grey-bellied Dunnart, *Sminthopsis griseoventer*	17	18	19		c	
White-footed Dunnart, *Sminthopsis leucopus*	26	23	20		c	
Common Dunnart, *Sminthopsis murina*	28	25	22		c	
Red-cheeked Dunnart, *Sminthopsis virginiae*		40		y	c	
Rufous Spiny Bandicoot, *Echymipera rufescens*	1800	1500	1200	y	c	
Golden Bandicoot, *Isoodon auratus*		450		y	o	e
Brindled Bandicoot, *Isoodon macrourus*	2100	1600	1100	y	o	
Quenda, Southern Brown Bandicoot, *Isoodon obesulus*	850	775	700	y	o	
Western Barred Bandicoot, *Perameles bougainville*		220		y	o	e
Eastern Barred Bandicoot, *Perameles gunnii*		660		y	o	
Long-nosed Bandicoot, *Perameles nasuta*		1000		y	c	
Southern Hairy-nosed Wombat, *Lasiorhinus latifrons*		25000			h	
Common Wombat, *Vombatus ursinus*		26000			h	
Koala, *Phascolarctos cinereus*	9200	7850	6500		h	
Tasmanian Bettong, *Bettongia gaimardii*		1660		y	h	
Woylie, Brush-tailed Bettong, *Bettongia penicillata*		1300		y	h	e
Long-nosed Potoroo, *Potorous tridactylus*	1180	1100	1020	y	o	
Boodie, Burrowing Bettong, *Bettongia lesueur*		1500		y	h	e
Spectacled Hare-wallaby, *Lagorchestes conspicillatus*		3000		y	h	
Mala, Rufous Hare-wallaby, *Lagorchestes hirsutus*	1580	1660	1740	y	h	e
Banded Hare-wallaby, *Lagostrophus fasciatus*		1800		y	h	e
Agile Wallaby, *Macropus agilis*	19000	15000	11000		h	
Tammar Wallaby, *Macropus eugenii*	4780	4200	3650	y	h	
Western Grey Kangaroo, *Macropus fuliginosus*	50000	38500	27000		h	
Eastern Grey Kangaroo, *Macropus giganteus*	50000	38500	27000		h	
Whiptail Wallaby, *Macropus parryi*	16000	13500	11000		h	
Euro, Common Wallaroo, *Macropus robustus*	30000	23500	17000		h	
Barrow Island Euro, *Macropus robustus isabellinus*		15000			h	v
Red-necked Wallaby, *Macropus rufogriseus*	18600	16200	13800		h	
Red Kangaroo, *Macropus rufus*	45000	33500	22000		h	
Northern Nailtail Wallaby, *Onychogalea unguifera*	5500	5000	4500	y	h	
Allied Rock-wallaby, *Petrogale assimilis*		4000		y	h	
Short-eared Rock-wallaby, *Petrogale brachyotis*		4500		y	h	
Monjon, *Petrogale burbidgei*		1260		y	h	
Nabarlek, *Petrogale concinna*		1350		y	h	
Unadorned Rock-wallaby, *Petrogale inornata*		4000		y	h	
Black-footed Rock-wallaby, *Petrogale lateralis*	4000	3700	3400	y	h	v
Proserpine Rock-wallaby, *Petrogale persephone*		6500			h	v
Rothschild's Rock-wallaby, *Petrogale rothschildi*		5250		y	h	
Quokka, *Setonix brachyurus*	3600	3250	2900	y	h	
Tasmanian Pademelon, *Thylogale billardieri*	7000	5450	3900	y	h	
Red-legged Pademelon, *Thylogale stigmatica*	5100	4650	4200	y	h	
Swamp Wallaby, *Wallabia bicolor*	17000	15000	13000		h	
Feathertail Glider, *Acrobates pygmaeus*		12			h	
Spotted Cuscus, *Phalanger maculatus*		3000		y	h	
Grey Cuscus, *Phalanger orientalis*		2000		y	h	
Northern Brushtail Possum, *Trichosurus arnhemensis*	1600	1450	1300	y	h	
Mountain Brushtail Possum, *Trichosurus caninus*		3500		y	h	

NAME	F WT	MABW	M WT	CWR	DIET	STATUS
Common Brushtail Possum, *Trichosurus vulpecula*	3500	3000	2500	y	h	
Scaly-tailed Possum, *Wyulda squamicaudata*		1300		y	h	
Sugar Glider, *Petaurus breviceps*	140	130	120	y	o	
Wogoit, Rock Ringtail Possum, *Pseudocheirus dahli*		1750		y	h	
Common Ringtail Possum, *Pseudocheirus peregrinus*		900		y	h	
Western Pygmy-possum, *Cercartetus concinnus*		13			o	
Little Pygmy-possum, *Cercartetus lepidus*		7			c	
Eastern Pygmy-possum, *Cercartetus nanus*		24			o	
Bare-backed Fruit-bat, *Dobsonia moluccense*		450			h	
Northern Blossom-bat, *Macroglossus minimus*		14			h	
Queensland Tube-nosed Bat, *Nyctimene robinsoni*		40			h	
Black Flying-fox, *Pteropus alecto*		600			h	
Percy Island Flying Fox, *Pteropus brunneus*					h	
Spectacled Flying-fox, *Pteropus conspicillatus*		500			h	
Pteropus melanotus					h	
Grey-headed Flying-fox, *Pteropus poliocephalus*		675			h	
Little Red Flying-fox, *Pteropus scapulatus*		360			h	
Queensland Blossom-bat, *Syconycteris australis*		15			h	
Naked-rumped Sheathtail-bat, *Saccolaimus saccolaimus*		45			c	
North-eastern Sheathtail-bat, *Taphozous australis*		40			c	
Yellow-bellied Sheathtail-bat, *Taphozous flaviventris*	37	40	43		c	
Common Sheathtail-bat, *Taphozous georgianus*		18			c	
Ghost Bat, *Macroderma gigas*		150			c	v
Hipposideros cervinus		12			c	
Eastern Horseshoe-bat, *Rhinolophus megaphyllus*		10			c	
Dusky Horseshoe-bat, *Hipposideros ater*		9			c	
Diadem Horseshoe-bat, *Hipposideros diadema*		40			c	
Lesser Wart-nosed Horseshoe-bat, *Hipposideros stenotis*		12			c	
Orange Horseshoe-bat, *Rhinonicterus aurantius*		9			c	
Gould's Wattled Bat, *Chalinolobus gouldii*		14			c	
Chocolate Wattled Bat, *Chalinolobus morio*		9			c	
Hoary Bat, *Chalinolobus nigrogriseus*		9			c	
Eptesicus caurinus		4			c	
Darlington's Eptesicus, *Eptesicus darlingtoni*					c	
Finlayson's Eptesicus, *Eptesicus finlaysoni*					c	
King River Eptesicus, *Eptesicus regulus*		6			c	
Large Forest Eptesicus, *Eptesicus sagittula*		8			c	
Troughton's Eptesicus, *Eptesicus troughtoni*					c	
Little Forest Eptesicus, *Eptesicus vulturnus*		5			c	
Great Pipistrelle, *Falsistrellus tasmaniensis*		20			c	
Little Bent-winged Bat, *Miniopterus australis*		8			c	
Common Bent-winged Bat, *Miniopterus schreibersii*		15			c	
Large-footed Mouse-eared Bat, *Myotis adversus*		10			c	
Arnhem Land Long-eared Bat, *Nyctophilus arnhemensis*		7			c	
North Queensland Long-eared Bat, *Nyctophilus bifax*		11			c	
Lesser Long-eared Bat, *Nyctophilus geoffroyi*		7			c	
Gould's Long-eared Bat, *Nyctophilus gouldi*		9			c	
Greater Long-eared Bat, *Nyctophilus timoriensis*		17			c	
Pipistrellus murrayi					c	
Timor Pipistrelle, *Pipistrellus tenuis*		5			c	
Western Broad-nosed Bat, *Scotorepens balstoni*		10			c	
Little Broad-nosed Bat, *Scotorepens greyii*		10			c	
White-striped Mastiff-bat, *Nyctinomus australis*		35			c	
*Hare, *Lepus capensis*	4000	4000	4000		h	
*Rabbit, *Oryctolagus cuniculus*	1590	1580	1570		h	
Brush-tailed Rabbit-rat, *Conilurus penicillatus*		150		y	h	
Water Rat, *Hydromys chrysogaster*	775	685	610	y	c	
Forrest's Mouse, *Leggadina forresti*		20			h	
Lakeland Downs Mouse, *Leggadina lakedownensis*		18			h	
Greater Stick-nest Rat, *Leporillus conditor*		350		y	h	e
Broad-toothed Rat, *Mastacomys fuscus*		120		y	h	
Grassland Melomys, *Melomys burtoni*	60	55	50	y	h	
Fawn-footed Melomys, *Melomys cervinipes*		80		y	h	
Melomys rubicola					?	
Black-footed Tree-rat, *Mesembriomys gouldii*	680	630	580	y	h	
Golden-backed Tree-rat, *Mesembriomys macrurus*		205		y	o	
*House Mouse, *Mus musculus*		20			o	
Northern Hopping-mouse, *Notomys aquilo*		39		y	h	
Prehensile-tailed Rat, *Pogonomys mollipilosus*		62			h	
Ash-grey Mouse, *Pseudomys albocinereus*	35	31	26		h	
Delicate Mouse, *Pseudomys delicatulus*		12			h	
Desert Mouse, *Pseudomys desertor*		25			h	
Shark Bay Mouse, *Pseudomys fieldi*		45		y	h	e
Sandy Inland Mouse, *Pseudomys hermannsburgensis*		12			h	

NAME	F WT	MABW	M WT	CWR	DIET	STATUS
Long-tailed Mouse, *Pseudomys higginsi*		67		y	o	
Western Chestnut Mouse, *Pseudomys nanus*	36	35	33	y	h	
New Holland Mouse, *Pseudomys novaehollandiae*		16			o	
*Polynesian Rat, *Rattus exulans*					o	
Bush Rat, *Rattus fuscipes*	112	104	95	y	o	
Cape York Rat, *Rattus leucopus*		116		y	o	
Swamp Rat, *Rattus lutreolus*		122		y	o	
Christmas Island Rat, *Rattus macleari*						ex
Christmas Island Rat, *Rattus nativitatis*						ex
*Brown Rat, *Rattus norvegicus*		320			o	
*Black Rat, *Rattus rattus*		280			o	
Canefield Rat, *Rattus sordidus*	190	160	125	y	o	
Pale Field-rat, *Rattus tunneyi*	100	90	80	y	h	
Long-haired Rat, *Rattus villosissimus*	156	134	112	y	h	
White-tailed Rat, *Uromys caudimaculatus*	620	545	470	y	o	
False Water-rat, *Xeromys myoides*		50		y	c	v
Common Rock-rat, *Zyzomys argurus*		45		y	h	
Large Rock-rat, *Zyzomys woodwardi*		140		y	h	
*Dingo, Dog, *Canis familiaris*	16000	14500	13000		c	
*Red Fox, *Vulpes vulpes*	6500	6000	600		c	
*Feral Cat, *Felis catus*	5000	4000	3000		c	
New Zealand Fur-seal, *Arctocephalus forsteri*	160000	130000	60000		c	
Australian Fur-seal, *Arctocephalus pusillus*	279000	200000	78000		c	
Southern Elephant Seal, *Mirounga leonina*	3000000		300000		c	
Australian Sea-lion, *Neophoca cinerea*	300000		80000		c	
*Donkey, *Equus asinus*		32500			h	
*Horse, *Equus caballus*		400000			h	
*Pig, *Sus scrofa*	100000	75000	60000		o	
*One-humped Camel, *Camelus dromedarius*		550000			h	
*Chital, *Axis axis*	89000	70000	50000		h	
*Hog Deer, *Axis porcinus*	43000	380000	43000		h	
*Red Deer, *Cervus elephas*	150000	120000	92000		h	
*Rusa Deer, *Cervus timorensis*	73000	3000	53000		h	
*Sambar, *Cervus unicolor*	192000	170000	146000		h	
*Fallow Deer, *Dama dama*	59000	49000	38000		h	
*Cattle, *Bos taurus*		450000			h	
*Water Buffalo, *Bubalis bubalis*		750000			h	
*Goat, *Capra hircus*	58000	50000	44000		h	
*Sheep, *Ovis aries*					h	
Christmas Island Shrew, *Crocidura attenuata trichura*					c	

weights are in grams

*	exotic species
CWR	critical weight range species (Burbidge & McKenzie 1989) y = yes
DIET	c = carnivore (includes insectivore), h = herbivore, o = omnivore
F WT	weight of adult female
MABW	mean adult body weight (where no data on weights of sexes available)
M WT	weight of adult male
STATUS	threatened categories of ANZECC 1991 (ANPWS 1991): ex = extinct, e = endangered, v = vulnerable

DATABASE 3B: LIST OF MAMMALS BY SCIENTIFIC NAME

NAME	F WT	MABW	M WT	CWR	DIET	STATUS
Tachyglossus aculeatus, Echidna		4000		y	c	
Ornithorhynchus anatinus, Platypus	1520	1328	1135	y	c	
Thylacinus cynocephalus, Thylacine		25000			c	ex
Antechinus flaviipes, Mardo, Yellow-footed Antechinus	56	45	34	y	c	
Antechinus minimus, Swamp Antechinus	65	54	42	y	c	
Antechinus swainsonii, Dusky Antechinus	65	53	41	y	c	
Dasykaluta rosamondae, Little Red Antechinus	35	30	25		c	
Dasyurus hallucatus, Northern Quoll	650	525	400	y	c	
Dasyurus maculatus, Spotted-tailed Quoll	6000	4500	3000	y	c	
Dasyurus viverrinus, Eastern Quoll	1300	1090	880	y	c	v
Ningaui timealeyi, Pilbara Ningaui		8			c	
Parantechinus apicalis, Dibbler	80	70	60	y	c	e
Parantechinus bilarni, Sandstone Antechinus	40	35	30	y	c	
Phascogale tapoatafa, Brush-tailed Phascogale	200	175	145	y	c	
Planigale ingrami, Long-tailed Planigale	6	6	6		c	
Planigale maculata, Common Planigale	12	11	10		c	
Pseudantechinus macdonnellensis, Fat-tailed Antechinus		25			c	
Pseudantechinus mimulus, Carpentarian Antechinus		16			c	
Pseudantechinus ningbing, Ningbing Antechinus	18	20	22		c	
Sarcophilus harrisii, Tasmanian Devil	8000	7000	6000		c	
Sminthopsis aitkeni, Kangaroo Island Dunnart					c	
Sminthopsis butleri, Carpentarian Dunnart		28			c	
Sminthopsis dolichura, Little Long-tailed Dunnart	14	14	13		c	
Sminthopsis griseoventer, Grey-bellied Dunnart	17	18	19		c	
Sminthopsis leucopus, White-footed Dunnart	26	23	20		c	
Sminthopsis murina, Common Dunnart	28	25	22		c	
Sminthopsis virginiae, Red-cheeked Dunnart		40		y	c	
Echymipera rufescens, Rufous Spiny Bandicoot	1800	1500	1200	y	c	
Isoodon auratus, Golden Bandicoot,		450		y	o	e
Isoodon macrorus, Brindled Bandicoot	2100	1600	1100	y	o	
Isoodon obesulus, Quenda, Southern Brown Bandicoot	850	775	700	y	o	
Perameles bougainville, Western Barred Bandicoot		220		y	o	e
Perameles gunnii, Eastern Barred Bandicoot		660		y	o	
Perameles nasuta, Long-nosed Bandicoot		1000		y	c	
Lasiorhinus latifrons, Southern Hairy-nosed Wombat		25000			h	
Vombatus ursinus, Common Wombat		26000			h	
Phascolarctos cinereus, Koala	9200	7850	6500		h	
Bettongia gaimardii, Tasmanian Bettong		1660		y	h	
Bettongia penicillata, Woylie, Brush-tailed Bettong		1300		y	h	e
Potorous tridactylus, Long-nosed Potoroo	1180	1100	1020	y	o	
Bettongia lesueur, Boodie, Burrowing Bettong		1500		y	h	e
Lagorchestes conspicillatus, Spectacled Hare-wallaby		3000		y	h	
Lagorchestes hirsutus, Mala, Rufous Hare-wallaby	1580	1660	1740	y	h	e
Lagostrophus fasciatus, Banded Hare-wallaby		1800		y	h	e
Macropus agilis, Agile Wallaby	19000	15000	11000		h	
Macropus eugenii, Tammar Wallaby	4780	4200	3650	y	h	
Macropus fuliginosus, Western Grey Kangaroo	50000	38500	27000		h	
Macropus giganteus, Eastern Grey Kangaroo	50000	38500	27000		h	
Macropus parryi, Whiptail Wallaby	16000	13500	11000		h	
Macropus robustus, Euro, Common Wallaroo	30000	23500	17000		h	
Macropus robustus isabellinus, Barrow Island Euro		15000			h	v
Macropus rufogriseus, Red-necked Wallaby	18600	16200	13800		h	
Macropus rufus, Red Kangaroo	45000	33500	22000		h	
Onychogalea unguifera, Northern Nailtail Wallaby	5500	5000	4500	y	h	
Petrogale assimilis, Allied Rock-wallaby		4000		y	h	
Petrogale brachyotis, Short-eared Rock-wallaby		4500		y	h	
Petrogale burbidgei, Monjon		1260		y	h	
Petrogale concinna, Nabarlek		1350		y	h	
Petrogale inornata, Unadorned Rock-wallaby		4000		y	h	
Petrogale lateralis, Black-footed Rock-wallaby	4000	3700	3400	y	h	v
Petrogale persephone, Proserpine Rock-wallaby		6500			h	v
Petrogale rothschildi, Rothschild's Rock-wallaby		5250		y	h	
Setonix brachyurus, Quokka	3600	3250	2900	y	h	
Thylogale billardieri, Tasmanian Pademelon	7000	5450	3900	y	h	
Thylogale stigmatica, Red-legged Pademelon	5100	4650	4200	y	h	
Wallabia bicolor, Swamp Wallaby	17000	15000	13000		h	
Acrobates pygmaeus, Feathertail Glider		12			h	
Phalanger maculatus, Spotted Cuscus		3000		y	h	
Phalanger orientalis, Grey Cuscus		2000		y	h	
Trichosurus arnhemensis, Northern Brushtail Possum,	1600	1450	1300	y	h	
Trichosurus caninus, Mountain Brushtail Possum		3500		y	h	

NAME	F WT	MABW	M WT	CWR	DIET	STATUS
Trichosurus vulpecula, Common Brushtail Possum	3500	3000	2500	y	h	
Wyulda squamicaudata, Scaly-tailed Possum		1300		y	h	
Petaurus breviceps, Sugar Glider	140	130	120	y	o	
Pseudocheirus dahli, Wogoit, Rock Ringtail Possum		1750		y	h	
Pseudocheirus peregrinus, Common Ringtail Possum		900		y	h	
Cercartetus concinnus, Western Pygmy-possum		13			o	
Cercartetus lepidus, Little Pygmy-possum		7			c	
Cercartetus nanus, Eastern Pygmy-possum		24			o	
Dobsonia moluccense, Bare-backed Fruit-bat		450			h	
Macroglossus minimus, Northern Blossom-bat		14			h	
Nyctimene robinsoni, Queensland Tube-nosed Bat		40			h	
Pteropus alecto, Black Flying-fox		600			h	
Pteropus brunneus, Percy Island Flying Fox					h	
Pteropus conspicillatus, Spectacled Flying-fox		500			h	
Pteropus melanotus					h	
Pteropus poliocephalus, Grey-headed Flying-fox		675			h	
Pteropus scapulatus, Little Red Flying-fox		360			h	
Syconycteris australis, Queensland Blossom-bat		15			h	
Saccolaimus saccolaimus, Naked-rumped Sheathtail-bat		45			c	
Taphozous australis, North-eastern Sheathtail-bat		40			c	
Taphozous flaviventris, Yellow-bellied Sheathtail-bat	37	40	43		c	
Taphozous georgianus, Common Sheathtail-bat		18			c	
Macroderma gigas, Ghost Bat		150			c	v
Hipposideros cervinus		12			c	
Rhinolophus megaphyllus, Eastern Horseshoe-bat		10			c	
Hipposideros ater, Dusky Horseshoe-bat		9			c	
Hipposideros diadema, Diadem Horseshoe-bat		40			c	
Hipposideros stenotis, Lesser Wart-nosed Horseshoe-bat		12			c	
Rhinonicterus aurantius, Orange Horseshoe-bat		9			c	
Chalinolobus gouldii, Gould's Wattled Bat		14			c	
Chalinolobus morio, Chocolate Wattled Bat		9			c	
Chalinolobus nigrogriseus, Hoary Bat		9			c	
Eptesicus caurinus		4			c	
Eptesicus darlingtoni, Darlington's Eptesicus					c	
Eptesicus finlaysoni, Finlayson's Eptesicus					c	
Eptesicus regulus, King River Eptesicus		6			c	
Eptesicus sagittula, Large Forest Eptesicus		8			c	
Eptesicus troughtoni, Troughton's Eptesicus					c	
Eptesicus vulturnus, Little Forest Eptesicus		5			c	
Falsistrellus tasmaniensis, Great Pipistrelle		20			c	
Miniopterus australis, Little Bent-winged Bat		8			c	
Miniopterus schreibersii, Common Bent-winged Bat		15			c	
Myotis adversus, Large-footed Mouse-eared Bat		10			c	
Nyctophilus arnhemensis, Arnhem Land Long-eared Bat		7			c	
Nyctophilus bifax, North Queensland Long-eared Bat		11			c	
Nyctophilus geoffroyi, Lesser Long-eared Bat		7			c	
Nyctophilus gouldi, Gould's Long-eared Bat		9			c	
Nyctophilus timoriensis, Greater Long-eared Bat		17			c	
Pipistrellus murrayi					c	
Pipistrellus tenuis, Timor Pipistrelle		5			c	
Scotorepens balstoni, Western Broad-nosed Bat		10			c	
Scotorepens greyii, Little Broad-nosed Bat		10			c	
Nyctinomus australis, White-striped Mastiff-bat		35			c	
**Lepus capensis,* Hare	4000	4000	4000		h	
**Oryctolagus cuniculus,* Rabbit	1590	1580	1570		h	
Conilurus penicillatus, Brush-tailed Rabbit-rat		150		y	h	
Hydromys chrysogaster, Water Rat	775	685	610	y	c	
Leggadina forresti, Forrest's Mouse		20			h	
Leggadina lakedownensis, Lakeland Downs Mouse		18			h	
Leporillus conditor, Greater Stick-nest Rat		350		y	h	e
Mastacomys fuscus, Broad-toothed Rat		120		y	h	
Melomys burtoni, Grassland Melomys	60	55	50	y	h	
Melomys cervinipes, Fawn-footed Melomys		80		y	h	
Melomys rubicola					?	
Mesembriomys gouldii, Black-footed Tree-rat	680	630	580	y	h	
Mesembriomys macrurus, Golden-backed Tree-rat		205		y	o	
**Mus musculus,* House Mouse		20			o	
Notomys aquilo, Northern Hopping-mouse		39		y	h	
Pogonomys mollipilosus, Prehensile-tailed Rat		62			h	
Pseudomys albocinereus, Ash-grey Mouse	35	31	26		h	
Pseudomys delicatulus, Delicate Mouse		12			h	
Pseudomys desertor, Desert Mouse		25			h	
Pseudomys fieldi, Shark Bay Mouse		45		y	h	e
Pseudomys hermannsburgensis, Sandy Inland Mouse		12			h	

NAME	F WT	MABW	M WT	CWR	DIET	STATUS
Pseudomys higginsi, Long-tailed Mouse		67		y	o	
Pseudomys nanus, Western Chestnut Mouse,	36	35	33	y	h	
Pseudomys novaehollandiae, New Holland Mouse		16			o	
**Rattus exulans*, Polynesian Rat					o	
Rattus fuscipes, Bush Rat	112	104	95	y	o	
Rattus leucopus, Cape York Rat		116		y	o	
Rattus lutreolus, Swamp Rat		122		y	o	
Rattus macleari, Christmas Island Rat						ex
Rattus nativitatis, Christmas Island Rat						ex
**Rattus norvegicus*, Brown Rat		320			o	
**Rattus rattus*, Black Rat		280			o	
Rattus sordidus, Canefield Rat	190	160	125	y	o	
Rattus tunneyi, Pale Field-rat	100	90	80	y	h	
Rattus villosissimus, Long-haired Rat	156	134	112	y	h	
Uromys caudimaculatus, White-tailed Rat	620	545	470	y	o	
Xeromys myoides, False Water-rat		50		y	c	v
Zyzomys argurus, Common Rock-rat		45		y	h	
Zyzomys woodwardi, Large Rock-rat		140		y	h	
**Canis familiaris*, Dingo, Dog	16000	14500	13000		c	
**Vulpes vulpes*, Red Fox	6500	6000	600		c	
**Felis catus*, Feral Cat	5000	4000	3000		c	
Arctocephalus forsteri, New Zealand Fur-seal	160000	130000	60000		c	
Arctocephalus pusillus, Australian Fur-seal	279000	200000	78000		c	
Mirounga leonina, Southern Elephant Seal	3000000		300000		c	
Neophoca cinerea, Australian Sea-lion	300000		80000		c	
**Equus asinus*, Donkey		325000			h	
**Equus caballus*, Horse		400000			h	
**Sus scrofa*, Pig	100000	75000	60000		o	
**Camelus dromedarius*, One-humped Camel		550000			h	
**Axis axis*, Chital	89000	70000	50000		h	
**Axis porcinus*, Hog Deer	43000	380000	43000		h	
**Cervus elephas*, Red Deer	150000	120000	92000		h	
**Cervus timorensis*, Rusa Deer	73000	3000	53000		h	
**Cervus unicolor*, Sambar	192000	170000	146000		h	
**Dama dama*, Fallow Deer	59000	49000	38000		h	
**Bos taurus*, Cattle		450000			h	
**Bubalis bubalis*, Water Buffalo		750000			h	
**Capra hircus*, Goat	58000	50000	44000		h	
**Ovis aries*, Sheep					h	
Crocidura attenuata trichura, Christmas Island Shrew					c	

weights are in grams

*	exotic species
CWR	critical weight range species (Burbidge & McKenzie 1989) y = yes
DIET	c = carnivore (includes insectivore), h = herbivore, o = omnivore
F WT	weight of adult female
MABW	mean adult body weight (where no data on weights of sexes available)
M WT	weight of adult male
STATUS	threatened categories of ANZECC 1991 (ANPWS 1991): ex = extinct, e = endangered, v = vulnerable

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Equations for the forest fire behaviour tables for Western Australia

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ABSTRACT

Sneeuwjagt and Peet's forest fire behaviour tables for Western Australia are used to predict fire behaviour for forest types that are common throughout the south-west of the State. This work expresses the data from the tables in the form of equations; bounds are provided for the original research data and for the range of conditions to which the tables have been extrapolated for practical application. A new structure is presented for the methodology of the system to clarify and simplify its use. The equations and the prediction methodology presented provide a succinct and modular system that can be applied to automate the process of predicting fire danger or fire behaviour using a computer.

INTRODUCTION

The forest fire behaviour tables for Western Australia (Sneeuwjagt and Peet 1985) are used throughout the south-west of the State for forecasting forest fire danger and as a guide to predicting forest fire behaviour. The tables provide for predictions of fuel characteristics, and fire behaviour characteristics for the fuel types that occur in forest associations formed by pure and mixed stands of the six major tree species: these are, jarrah (*Eucalyptus marginata* Sm.); marri (*E. calophylla* R.Br.); karri (*E. diversicolor* F. Muell.); wandoo (*E. wandoo* Blakely); radiata pine (*Pinus radiata* D. Don.); and maritime pine (*P. pinaster* Ait.). The tables aim to provide for predictions of: weather conditions, such as daily maximum temperature and minimum relative humidity; total and available fuel quantities; fuel flammability as indicated by fuel moisture; fire danger indices for standard fuels; forward rates of fire spread for given conditions of fuels, weather and topography; scorch heights; indices to support the planning of prescribed burns such as hours of burning time available; and indices to support fire suppression, such as fire fighting resources required.

The tables were derived empirically from fuel, weather and fire behaviour characteristics measured for experimental fires that were conducted in the field. Test fire data were also supplemented with reliable wildfire data to produce the tables (Burrows and Sneeuwjagt 1989). In general, the tables were derived by eye fitting curves or using least-squares procedures (Peet 1971a).

The tables began as a simple, formal, scientific approach to forecasting fire danger, but over the past 25 years they have evolved into a detailed, complex system to support many aspects of fire management (see, for example: Peet 1965; Harris 1968; Hatch 1969; Beggs 1972, 1973, 1976; Sneeuwjagt and Peet 1979). The tables have been updated, and prediction facilities have been expanded, to keep pace with increasing demands and expectations of fire management (Burrows and Sneeuwjagt 1989). As a result of continuing updates and expansions, the tabular format and structure of the prediction system is somewhat cumbersome, slow and confusing to use. This situation will worsen as future research and developments continue to broaden the scope and scale of the prediction system.

The tables cannot be compared readily with other existing fire behaviour prediction systems because they are cumbersome to use, and present discrete rather than continuous predictive functions. Although these problems are largely overcome by computerizing the system, equations that have been formulated to give continuous predictions for continuous inputs would have the added advantage of ease of comparison with other systems. This work presents equations that have been derived to fit the data within each of the tables.

The primary objective of this work has been to fit equations for the tables that are used to predict fire danger and fire behaviour characteristics. The tables that are used locally to predict required dispatch levels, vehicle travel times and fireline production rates in the event of a wildfire, are not dealt with here.

During the process of reviewing the prediction system, which was necessary to derive these equations, it became apparent that the methodology of the prediction system changes with the required accuracy of the predictions. In several cases in Sneeuwjagt and Peet (1985), alternative methods are provided to predict a given parameter, although the circumstances that govern the application of one table over another are not detailed. For example, litter weights can be predicted from the number of annual leaf falls since the last fire (tables 7.1.1., 7.1.2. or 7.1.3.) or litter weight can be predicted from litter depth (table 7.2.1.). In this paper a new structure is presented for the methodology of the prediction system and application procedures are detailed for each table and equation.

The data expressed in the tables given by Sneeuwjagt and Peet (1985) include extrapolations from measured data. These extrapolations are necessary to generate predictions for all situations that are encountered operationally. To date, the limits of the original data have not been available readily because only a proportion of the research work, which is encompassed within the tables, has been published. In conjunction with the equations, the application limits and the bounds of the original research data are presented in an attempt to identify the range of inputs for which predictions should be most reliable, and the limits to which extrapolations have been made.

The accuracy of each equation, with respect to its ability to predict the data in a table, is presented. Predictions using the functions derived describe the table data, but extrapolating the equations beyond their application limits would be completely inappropriate. The equations were designed to predict the data in the tables as accurately as possible and no reference to the accuracy of the tables themselves is intended.

METHODS

Data were taken directly from the tables that were developed by Sneeuwjagt and Peet (1985). Where row or column values represented a range of inputs, mid-point values were used. Where two input options were presented within a table, such that one input may be used in lieu of another, equations were derived from the input that was used most often throughout the tables. An equation was fitted to measured scale displacements for the nomogram used to predict surface moisture content during the day (which is table 4.3.7 in Sneeuwjagt and Peet 1985), and data were taken and used to fit an equation to the graphs used to predict maximum temperature (8.1).

The 1985 edition of the tables (Sneeuwjagt and Peet 1985) was the result of a revision of the 1979 edition (Sneeuwjagt and Peet 1979). Revisions to three of the tables, namely those used to predict the overnight change in surface moisture content in the absence of rain (4.3.2), the basic drying unit (4.3.3), and the day drying correction (4.3.4), were not based on additional data but were made by interpolating and extrapolating ocularly from graphs of the table data (van Didden[1], personal communication). Equations in this paper were fitted to data in the 1979 edition of these tables so that interpolations and extrapolations are mathematically based.

Application bounds for the equations were all extracted directly from the 1985 edition of the tables. Original authors, researchers, internal reports, and publications were consulted to provide bounds for the original data.

Equations describing the relationships between table inputs and predicted outputs were derived using SAS (SAS Institute Inc. 1985). While a few of these relationships are linear, most are not, and non-linear least-squares procedures were used to establish the latter relationships.

A single equation was derived successfully for all tables that depict relationships using two predictor variables, with two exceptions: a single relationship could not be derived for jarrah and karri fuel quantity correction factors (tables 6.8 and 6.13 respectively). Instead, four equations were developed to describe the data within each of these tables.

Equations were not derived for the data of five of the tables. The tables used to assign wind ratios (6.5), scrub flammability factors (7.4.2) and scrub structural types from height density profiles (7.4.3) require qualitative or subjective inputs for which equations are inappropriate. Although equations relating wind ratio (see table 6.5 in Sneeuwjagt and Peet 1985) to tower height could have been fitted for each forest type and canopy, it was considerd that the coarse discrete categories depicted by Sneeuwjagt and Peet (1985) did not merit equations, especially in light of the fact that more sophisicated techniques have been developed to adjust tower wind speeds to forest wind speeds or wind speeds 2 m above open ground (see, for example, Albini and Baughman 1979; Baughman 1981; Durre and Beer 1989).

According to Peet[2] (personal communication), the data from the tables that predict daily minimum relative humidity (8.2) and dew point temperature (8.3) were not based on local research but were extracted from a weather observer's handbook such as that produced by the Bureau of Meteorology (1984). Equations for these two tables were adapted from the work of Murray (1967), Monteith (1973), and Abbott and Tabony (1985), which have been applied by others (Running *et al.* 1987; Beck and Trevitt 1989).

A SUMMARY OF THE PREDICTION SYSTEM

Two tree species dominate the forested areas of the south-west of Western Australia (WA): these are jarrah and karri. In the south-west, the northern jarrah forests are characterized by a shallow (< 20 mm) litter bed and a sparse, low (<1 m) understorey (known as scrub). The wetter karri and jarrah forests in the south are characterized by a dense, tall (sometimes exceeding 5 m) understorey, trash (suspended, dead vegetation) and a deep litter bed (Burrows and Sneeuwjagt 1989). Luke and McArthur (1978) described the northern jarrah and the southern forests as dry and wet sclerophyll forests respectively.

[1] G.W. van Didden, Fire Protection Branch, Department of Conservation and Land Management, Como WA.

[2] G.B. Peet, Manager, Fire Protection Branch, Department of Conservation and Land Management, Como, now retired.

One of six scrub structural types (Sneeuwjagt 1971a) is assumed or referenced directly in the fire behaviour tables to define a specific fuel complex. For example, northern jarrah is commonly found in association with scrub structural type 6, and karri 3/6 represents a karri overstorey with an understorey of scrub structural type 3 or type 6. Specific fuel complexes and scrub structural types are detailed in Appendix 1.

The forest fire behaviour tables for WA have been developed using the fuel complexes of northern jarrah and karri 4/5 as the bases to predict all fuel moisture and fire behaviour characteristics. In essence, one of two fire behaviour models is used depending on whether predictions are being generated for a jarrah fuel type or a karri fuel type. A fuel type is classified herein as a jarrah type if it carries a sparse, low understorey, or as a karri type if it carries a dense understorey: northern jarrah, pines and upslope wandoo are considered to be jarrah fuel types; and karri fuel types include karri 3/6, karri 4/5, karri 1/2, karri regrowth, southern jarrah and gully wandoo.

In the WA prediction system, four parameters are considered to influence fire behaviour: these are, the moisture content of surface litter fuels; the quantity of fuel that is available for burning; the ground (1-2 m) wind speed in a forest stand; and the slope of the terrain. These four parameters are combined to predict a fire danger index based on either the northern jarrah or karri 4/5 model, according to fuel type. Surface moisture content and wind speed are first used to calculate a forward rate of headfire spread (m h^{-1}), under standard fuel and forest stand structural conditions that are typical of five-year-old jarrah or karri fuels (Burrows and Sneeuwjagt 1989). This spread rate, which is known as a fire danger index, is then corrected to allow for cases where fuel weight, forest stand structure or slope differ from the standard.

The input parameters that are required to derive a fire danger index can be obtained directly or indirectly from measurements conducted in the field, as they were for experimental fires. However, with the exception of terrain slope, which can be obtained from topographic maps, these parameters are not available or measured readily: for example, an available fuel quantity can only be obtained by measuring pre- and post-fire fuel loads; and although ground wind speeds and surface litter moisture contents can be measured directly to predict fire behaviour for prescribed burns, such measurements are not generally possible for wildfires. To overcome these problems, table facilities have been developed to predict these parameters.

A prediction sub-system is used to derive an available fuel quantity. The product of the total litter quantity and the available fuel factor is the available litter weight (Sneeuwjagt 1986). An available fuel factor represents the fraction of the litter bed that has a moisture content below the moisture content of extinction, which is the litter moisture content at which a fire cannot sustain combustion (approximately 25 and 30 per cent for eucalypt forests and pine plantations respectively).

Other tables in the available fuel quantity prediction sub-system include those used to estimate available scrub and trash fuels. Available scrub and trash quantities are derived as a function of scrub structural type and fuel dryness. Available scrub, trash and litter weights are added to yield a total available fuel quantity for a given fuel complex.

Several tables are used to predict litter fuel moisture contents and these constitute another prediction sub-system. The influence of seasonal and diurnal drying trends on dead fuel moisture contents are considered since moisture contents on any given day are derived as a function of those on the previous day. Two models provide the basis of litter moisture content predictions: surface moisture contents are based on the northern jarrah model, and profile moisture contents are based on the karri 4/5 model (see the next section for definitions of surface and profile moisture contents). The predicted surface moisture content for northern jarrah litter and profile moisture content for karri 4/5 litter are then adjusted to estimate surface and profile litter moisture contents for other fuel complexes. Using the moisture content prediction sub-system, litter moisture contents for all fuel complexes are maintained on a daily basis, in a bookkeeping fashion.

Table facilities have been used to estimate ground wind speeds in a forest stand, given a wind speed measured at, or forecast for, a fire tower that is located at a particular height above the stand canopy. A wind ratio is used to relate an unimpeded, tower wind speed to a forest wind speed 1-2 m above the ground. The overstorey, understorey and topographic location of a forest stand are considered for their ability to reduce an open tower wind speed, and wind ratios increase concomitantly with the frictional influence of a given stand (Burrows (1984) discusses the wind ratio concept in detail).

A surface litter moisture content must be derived using the moisture content prediction sub-system before a fire danger index can be calculated. As a result of this calculation sequence, the moisture content prediction sub-system is discussed first and the derivation of fire danger indices is detailed subsequently. The following steps are carried out sequentially to predict a forward rate of headfire spread for non-standard conditions: a fire danger index is calculated; an available fuel quantity is determined; a fuel quantity correction factor is derived; and finally the index is corrected for non-standard fuels and slope giving the spread rate for non-standard conditions. These steps are presented according to the sequence in which correction factors are calculated and applied.

In addition to fire spread rates, scorch heights and the amount of time that is available for prescribed burning can be predicted. These predictions are used primarily to support the planning of prescribed burns although they also provide valuable information during wildfires. Surface moisture contents, available fuel quantities and forward rates of fire spread are required to predict these fire behaviour characteristics, and they are calculated and discussed last.

Descriptions of all variables used are given in Appendix 2, and the tables in Sneeuwjagt and Peet (1985) to which the equations relate are given in Table 6.

MOISTURE CONTENTS

Surface and profile litter moisture contents, which apply to forest conditions of 50 per cent mottled shade, are predicted and recorded in a bookkeeping fashion daily. All moisture contents are expressed as a percentage of oven-dry fuel weight. 'Surface' refers to the top 10 mm of a litter bed, whereas 'profile' refers to the entire litter bed above the mineral soil, the total depth of which exceeds 20 mm. The moisture contents of these litter fuels are required for a number of reasons: surface moisture content indicates the flammability of fine, dead fuels (Underwood *et al.* 1988) and so it is used to predict a fire danger index and a rate of spread; surface and profile moisture contents are used to estimate an available litter fuel quantity, which is required to predict a rate of spread; and moisture contents between 0800 and 1700 hours can be calculated to support predictions of fire behaviour throughout the day.

The moisture content prediction sub-system has been developed to emulate major changes in moisture contents throughout the day, and Figure 1 depicts these changes for surface litter moisture contents. The timing of the daily minimum surface and profile litter moisture contents is a function of the timing of the daily maximum temperature and minimum relative humidity (Luke and McArthur 1978). As fuels dry throughout the day, moisture contents decrease from a daily maximum (at 0800 hours) to a daily minimum (at approximately 1500 hours). The extent of fuel drying is derived as a function of the initial (maximum) surface and profile moisture contents, and the fuel drying potential presented by the weather conditions of a given day.

The relative drying potential for a given day, which is expressed in the basic drying unit, is estimated from the expected daily maximum temperature and minimum relative humidity. Initial moisture contents and the basic drying unit are combined in the day drying correction, which is applied to reduce a daily maximum to a daily minimum moisture content (Fig. 1).

In the late afternoon, surface litter fuels generally absorb moisture as temperature decreases and relative humidity increases. In the absence of rain, surface litter fuel moisture contents increase from an afternoon minimum and reach a maximum early in the morning the next day, largely as a result of increased relative humidities (Luke and McArthur 1978). This overnight change in moisture content, known as the night wetting correction, is added to the minimum surface moisture content of the previous day to derive a maximum surface moisture content for the next day. Surface litter fuels continue to dry overnight occasionally when fuels are relatively moist or when overnight relative humidities are low, and so the night wetting correction may be positive or negative.

In the absence of rain, the overnight change in litter profile moisture content is normally very small (Sneeuwjagt[3], personal communication), and has therefore been set to zero. The minimum (1500 hours) profile

[3] R.J. Sneeuwjagt, Manager, Fire Protection Branch, Department of Conservation and Land Management, Como WA

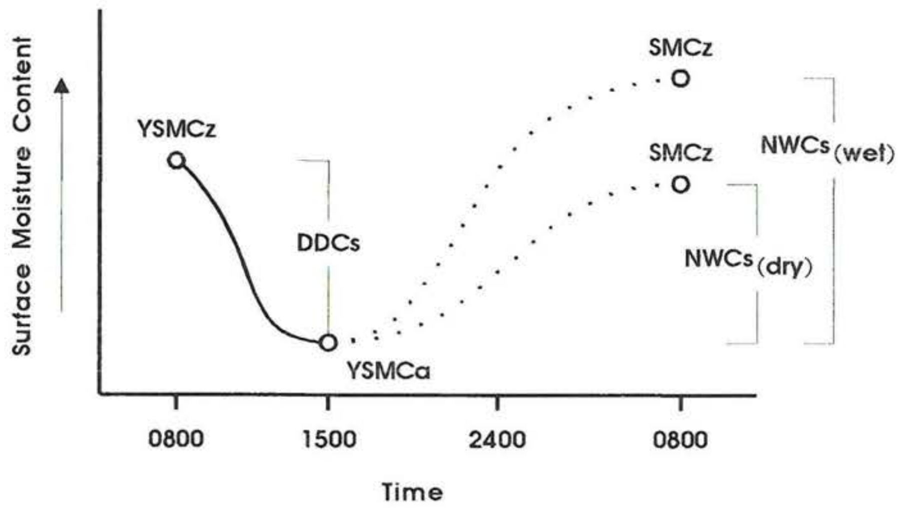

Figure 1. A diagrammatic representation of the major changes in diurnal surface litter moisture content that are emulated by the moisture content prediction sub-system (YSMCa/z is yesterday's minimum/maximum surface moisture content; DDCs is the day drying correction; SMCz is today's maximum surface moisture content; and NWCs is the night wetting correction in the absence of rain (dry) or in the event of rain (wet)).

moisture content on a given day is used to represent the maximum (0800 hours) on the following day.

The occurrence of rain, measured at 0800 hours for the previous 24-hour period, is reflected in the 0800 maximum surface and profile litter moisture contents, and so rainfall is considered to be an overnight wetting factor. McCaw[4] (personal communication) has identified this as a weakness in the current prediction system: if rainfall occurs between 0800 and 1500 hours the increased moisture content is not reflected in the minimum moisture content for that day, but in the 0800 maximum for the subsequent day.

Daily moisture content predictions, for a given fire season, are usually initiated early in September (spring) when fuels begin to dry. Oven drying procedures should be used to initiate the minimum (1500 hours) surface and profile moisture contents from field samples for the first day of the recording season. When oven drying facilities are unavailable, minimum surface and profile moisture contents are initiated at 60 and 100 per cent respectively, when the litter bed is saturated after a rainfall exceeding 10 mm. Values should be field checked by way of a moisture meter, such as the Marconi Moisture Meter, as soon as the predicted surface moisture content drops below 30 per cent.

Maximum Moisture Content

Maximum moisture contents (0800 hours) are calculated for the surface litter of northern jarrah and the litter profile of karri 4/5. These maxima are a function of the minima on the previous day and an overnight wetting correction. Daily moisture content accounting begins by determining the wetting correction, which is a function of the amount of rain in the past 24-hour period (measured at 0800 hours) or, in the absence of rain, the influence of overnight relative humidity on the wetting of fuels.

Night Wetting Corrections for Surface Litter

In the event of rain, the night wetting correction to yesterday's minimum surface moisture content for northern jarrah litter, $NWCs_{(wet)}$, is determined as a function of the amount of rainfall and yesterday's minimum surface moisture content:

$$NWCs_{(wet)} = A / (1 + B\ RAIN^{X}) \qquad [1]$$

where

$A = 121.42 - 94.27 / (1 + 107.55 \exp(-0.037\ YSMCa_{(NJ)}))$

$B = 101.71 / (1 + 17.13 \exp(-0.017\ YSMCa_{(NJ)}))$

$X = -0.84 - 0.62 / (1 + 1087.88 \exp(-0.053\ YSMCa_{(NJ)}))$

$YSMCa_{(NJ)}$ is yesterday's minimum surface moisture content for a given fuel type, which in this case is northern jarrah (NJ)[a] RAIN is the amount of rain (mm), recorded at 0800 hours, for the past 24 hour period

Application Bounds					Original Data[1b]				
5.	<	$YSMCa_{(NJ)}$	<	200.	6.	<	$YSMCa_{(NJ)}$	<	100.
0.1	<	RAIN	<	65.	0.1	<	RAIN	<	50.
					5.	<	$NWCs_{(wet)}$	<	100.

TABLE 1

Sources of the original data bounds, which are coded numerically by superscript, for the forest fire behaviour tables for Western Australia.

SUPERSCRIPT	SOURCE
1	R.J. Sneeuwjagt (personal communication)
2	G.W. van Didden (personal communication)
3	Underwood *et al.* (1985)
4	Peet (1971a)
5	N.D. Burrows (personal communication)
6	Peet *et al.* (1971)
7	Peet (1971b)
8	Hatch (1964)
9	Dept. of CALM (1985)
10	Sneeuwjagt (1973)
11	Burrows (1980)
12	Peet (1963)

In the absence of rain, the overnight change in the moisture content of jarrah surface litter, $NWCs_{(dry)}$, is a function of yesterday's minimum surface moisture content, and the intensity and duration of overnight relative humidities, which is reflected in the overnight relative humidity count as detailed by Peet *et al.* (1971):

$$NWCs_{(dry)} = Y\ ORHC + Z \qquad [2]$$

where

$Y = 0.29 / (1 + 1.34 \exp(-0.019\ YSMCa_{(NJ)}))$

$Z = 51.61 - 367.12(0.29/(1 + 1.34 \exp(-0.019\ YSMCa_{(NJ)})))$

ORHC is the overnight relative humidity count that represents the area enclosed by the overnight thermohygrograph trace, to 0800 hours, that exceeds the 70 per cent relative humidity level. The squares below the trace line are counted and one unit is equivalent to 2 per cent relative humidity over a two-hour duration.

Application Bounds					Original Data[1]				
0.	<	$YSMCa_{(NJ)}$	<	160.	6.	<	$YSMCa_{(NJ)}$	<	100.
0.	<	ORHC	<	101.	0.	<	ORHC	<	110.
					-35.	<	$NWCs_{(dry)}$	<	15.

Today's predicted maximum surface moisture content for northern jarrah ($SMCz_{(NJ)}$) is then calculated from:

$$SMCz_{(NJ)} = YSMCa_{(NJ)} + NWCs_{(wet/dry)} \qquad [3]$$

[4] W.L. McCaw, Senior Research Scientist, Science and Information Division, Department of Conservation and Land Management, Manjimup WA.

[a] Variable subscripts that contain capital letters within parentheses are abbreviated names of fuel types or scrub structural types, and these are detailed in Appendix 1.

[b] Numerical superscripts refer to the source of the bounds of the original data and these sources are summarized in Table 1.

Night Wetting Corrections for the Litter Profile

Today's maximum profile moisture content for karri 4/5 ($PMCz_{(K45)}$) is derived by modifying Equations 1 and 3. In the event of rain, Equation 1 is used to predict the night wetting correction by replacing $NWCs_{(wet)}$ with $NWCp_{(wet)}$. The $PMCz_{(K45)}$ is calculated by replacing $YSMCa_{(NJ)}$, in Equation 1 and 3, with yesterday's minimum profile moisture content for karri 4/5, $YPMCa_{(K45)}$, and substituting $PMCz_{(K45)}$ for $SMCz_{(NJ)}$ in Equation 3.

On rainless nights, today's maximum profile moisture content for karri 4/5 is assumed to be equal to yesterday's minimum profile moisture content. Hence, $NWCp_{(dry)}$ is equal to zero and Equation 2 is not used.

Minimum Moisture Content

A day drying correction is applied to the predicted daily maximum surface and profile litter moisture contents to reduce these maxima to daily minima. Litter fuel drying trends are expressed in the day drying correction as a function of initial (0800 maximum) moisture content and the basic drying unit. Maximum moisture contents having been obtained via Equations 1-3, the basic drying unit must then be determined before a day drying correction can be calculated.

The basic drying unit (BDU) is a relative index that is used to reflect the effects of day-time temperature and relative humidity on the drying of surface litter and the litter profile fuels during the day. The BDU is determined from actual or forecast values of daily minimum relative humidity and maximum temperature.

Maximum Temperature and Minimum Relative Humidity

If forecast values for a particular location are unavailable for minimum relative humidity and maximum temperature, they can be predicted from actual wet and dry bulb temperatures and the time at which they were measured. If clear skies prevail, Equation 4 can be used to predict a maximum temperature, Tz (°C), which is assumed to occur at 1500 hours, from measurements taken between 1000 and 1400 hours, and a 1500 hour maximum can be assumed until 1700 hours:

$$Tz = Tt\ 8/t \div (Tt - (Tt\ 8/t\ ))\ /\ SIN(\pi/2\ 0.92\ (t - 8)\ /\ 7.) \qquad [4]$$

where

Tt is the temperature (°C) at time t

t is the time (decimal hours) at which temperature has been measured

Application Bounds				Original Data[2]			
10. <	t	<	14.		t = 10, 12 and 15		
15. <	Tt	<	39.	14.	< Tt	<	39.
	Tt < Tz			17.	< Tz	<	39.

The equation to predict minimum relative humidity, RHa (%), has been derived by adapting the work of Murray (1967), Monteith (1973) and Abbott and Tabony (1985):

$$RHa = 100\ (273.16+Tz)\ /\ (273.16 + Tdew)\ \exp\{17.38\ (Tdew/(239.0 + Tdew) - Tz/(239.0 + Tz))\} \qquad [5]$$

Application Bounds

15. <	Tz	<	40.
-4. <	Tdew	<	24.

where

Tdew is the dew point temperature (°C)

The dew point temperature required in Equation 5, can be calculated from wet bulb (Tw) (measured with an Assmann-type forced ventilation psychrometer) and dry bulb (T) temperatures (°C) at any time (t) via Equation 6 (adapted from Murray (1967), Sargent (1980) and Abbott and Tabony (1985)):

$$Tdew = 239.0\ /\ (1.\ /\ (\ln\ (VP\ /\ 6.107\ )\ /\ 17.38) - 1.) \qquad [6]$$

where

$$VP = 6.107\ \exp(17.38\ Tw\ /\ (Tw + 239.0)) - 0.667\ (T - Tw)$$

Application Bounds

12. <	T	<	36.
6. <	Tw	<	36.
	T > Tw		
15. <	T - Tw		

Basic Drying Unit

Given a maximum temperature and a minimum relative humidity, the basic drying unit can be calculated:

$$BDU = C\ /\ (1 + D\ \exp\ (E\ (100 - RHa))) \qquad [7]$$

where

$$C = 57.29\ /\ (1 + 1.93\ \exp\ (-0.042\ Tz))$$

$$D = 42.77\ /\ (Tz - 5.80)$$

$$E = -0.016\ Tz\ /\ (Tz - 5.27)$$

Application Bounds				Original Data[1]			
8. <	Tz	<	48.	15.	< Tz	<	40.
0. <	RHa	<	90.	10.	< RHa	<	70.
				8.	< BDU	<	35.

Day Drying Corrections for Northern Jarrah Surface Litter

Having determined the BDU, the day drying correction for the surface litter of northern jarrah, $DDCs_{(NJ)}$, is calculated:

$$DDCs_{(NJ)} = F\ BDU + G + 10 \qquad [8]$$

where

$$F = (SMCz_{(NJ)} - 103.79)/((SMCz_{(NJ)} - 103.79)^2 - 12643.93)\ 12.81 - 0.65$$

$$G = (SMCz_{(NJ)} - 99.70)\ /((SMCz_{(NJ)} - 99.70)^2 - 25199.32)\ 3570.12 - 23.26$$

	Application Bounds				Original Data[1]	
6.	< BDU <	35.		8.	< BDU <	35.
6.	< $SMCz_{(NJ)}$ <	200.		10.	< $SMCz_{(NJ)}$ <	150.
				-35.	< $DDCs_{(NJ)}$ <	3.

and applied to determine today's minimum surface moisture content for northern jarrah, $SMCa_{(NJ)}$:

$$SMCa_{(NJ)} = SMCz_{(NJ)} + DDCs_{(NJ)} \quad [9]$$

Day Drying Corrections for the Litter Profile of Karri 4/5

The day drying correction for the litter profile of karri 4/5, $DDCp_{(K45)}$, is calculated:

$$DDCp_{(K45)} = H\ BDU + I \quad [10]$$

where

$$H = (PMCz_{(K45)} - 112.15) / ((PMCz_{(K45)} - 112.15)^2 - 21835.42)\ 40.96 - 0.46$$

$$I = (PMCz_{(K45)} - 140.78) / ((PMCz_{(K45)} - 140.78)^2 - 24819.47)\ 298.78$$

	Application Bounds			Original Data[1]	
11.	< $PMCz_{(K45)}$ <	200.	12.	< $PMCz_{(K45)}$ <	160.
1.	< BDU <	35.	8.	< BDU <	35.
-21.	< $DDCp_{(K45)}$ <	4.	-15.	< $DDCp_{(K45)}$ <	2.

and applied to predict today's minimum profile moisture content for karri 4/5, $PMCa_{(K45)}$:

$$PMCa_{(K45)} = PMCz_{(K45)} + DDCp_{(K45)} \quad [11]$$

Moisture Contents of Non-standard Litter Fuels

Today's minimum or maximum surface litter moisture content for eucalypt forests other than northern jarrah can be calculated directly from $SMCa/z_{(NJ)}$ using Equations 12-16:

$$SMCa/z_{(SJ)} = 1.12\ SMCa/z_{(NJ)} \quad [12]$$

$$SMCa/z_{(K36)} = 1.20\ SMCa/z_{(NJ)} + 0.90 \quad [13]$$

$$SMCa/z_{(K45)} = 1.53\ SMCa/z_{(NJ)} - 0.10 \quad [14]$$

$$SMCa/z_{(K12)} = 1.61\ SMCa/z_{(NJ)} + 1.70 \quad [15]$$

$$SMCa/z_{(OS)} = 0.66\ SMCa/z_{(NJ)} + 1.66 \quad [16]$$

	Application Bounds			Original Data[1]	
4.	< $SMC_{(NJ)}$ <	50.	4.	< $SMC_{(NJ)}$ <	150.
5.	< $SMC_{(SJ)}$ <	56.	5.	< $SMC_{(SJ)}$ <	150.
6.	< $SMC_{(K36)}$ <	60.	6.	< $SMC_{(K36)}$ <	150.
7.	< $SMC_{(K45)}$ <	74.	7.	< $SMC_{(K45)}$ <	150.
9.	< $SMC_{(K12)}$ <	80.	9.	< $SMC_{(K12)}$ <	160.
4.	< $SMC_{(OS)}$ <	36.	4.	< $SMC_{(OS)}$ <	80.

or by using Equations 17-20 for pine fuels:

$$SMCa/z_{(PP)} = 0.74\ SMCa/z_{(NJ)} + 1.51 \quad [17]$$

$$AMCa/z_{(PP)} = 0.66\ SMCa/z_{(NJ)} + 1.40 \quad [18]$$

$$SMCa/z_{(PR)} = 0.86\ SMCa/z_{(NJ)} + 1.02 \quad [19]$$

$$AMCa/z_{(PR)} = 0.77\ SMCa/z_{(NJ)} + 2.29 \quad [20]$$

where

AMCa/z refers to the minimum/maximum moisture content of fresh, aerated needles on branches generated from a thinning or pruning operation.

	Application Bounds			Original Data[1]	
5.	< $SMC_{(NJ)}$ <	80.	5.	< $SMC_{(NJ)}$ <	100.
5.	< $SMC_{(PP)}$ <	63.	5.	< $SMC_{(PP)}$ <	100.
4.	< $AMC_{(PP)}$ <	56.	4.	< $AMC_{(PP)}$ <	60.
5.	< $SMC_{(PR)}$ <	70.	5.	< $SMC_{(PR)}$ <	120.
5.	< $AMC_{(PR)}$ <	64.	5.	< $AMC_{(PR)}$ <	60.

Today's minimum or maximum profile moisture content for fuel types other than karri 4/5 can be calculated directly from $PMCa/z_{(K45)}$ using Equations 21-25:

$$PMCa/z_{(SJ)} = 0.75\ PMCa/z_{(K45)} + 2.19 \quad [21]$$

$$PMCa/z_{(K36)} = 0.81\ PMCa/z_{(K45)} + 2.98 \quad [22]$$

$$PMCa/z_{(K12)} = 1.26\ PMCa/z_{(K45)} + 2.28 \quad [23]$$

$$PMCa/z_{(PP)} = 1.29\ PMCa/z_{(K45)} - 1.87 \quad [24]$$

$$PMCa/z_{(PR)} = 1.26\ PMCa/z_{(K45)} + 2.95 \quad [25]$$

	Application Bounds		Original Data[1]
11.	< $PMC_{(K45)}$ <	100.	As applied
10.	< $PMC_{(SJ)}$ <	80.	
11.	< $PMC_{(K36)}$ <	85.	
16.	< $PMC_{(K12)}$ <	125.	
13.	< $PMC_{(PP)}$ <	125.	
16.	< $PMC_{(PR)}$ <	125.	

Day-time Moisture Contents

To predict fire behaviour characteristics at a given time between 0800 and 1700 hours, the surface moisture content at that time is required: there is no provision in the current tables to predict moisture contents, and therefore fire behaviour characteristics, between 1700 hours and 0800 hours the next day.

The surface moisture content for northern jarrah at any time (t) (in decimal hours), $SMC_{(NJ)}$, can be predicted using:

$$SMC_{(NJ)} = SMCz_{(NJ)} - (SMCz_{(NJ)} - SMCa_{(NJ)})\ (14.29\ t - 114.29)/\ 100. \quad [26a]$$

$$8.0 < t < 15.0$$

$$SMC_{(NJ)} = SMCz_{(NJ)} - (SMCz_{(NJ)} - SMCa_{(NJ)})\ (14.29(30.0 - t) - 114.29)/\ 100. \quad [26b]$$

$$15.0 < t < 17.0$$

	Application Bounds		Original data[1]
6.	< $SMC_{(NJ)}$ <	30.	Source of 26a unknown
	$SMCa_{(NJ)}$ <	$SMCz_{(NJ)}$	Source of 26b unknown

If predictions are required for a fuel type other than northern jarrah, Equations 12-20 can be employed to calculate the required SMC from that of northern jarrah at time (t).

Profile moisture contents, which are used to calculate available fuel factors for non-standard fuels, are also required for diurnal fire behaviour predictions. There has been no research conducted to address this need specifically, although any one of three methods is employed to approximate the profile moisture contents for karri 4/5 at any time between 0800 and 1500 hours, $PMC_{(K45)}$: the minimum profile moisture content is assumed throughout the day; the profile moisture content at any time is extrapolated linearly from the maximum and minimum and the minimum is applied after 1500 hours; or diurnal profile moisture contents are derived using Equation 26a by substituting $PMCa/z_{(K45)}$ for $SMCa/z_{(NJ)}$ and applying the minimum after 1500 hours. If predictions are required for a fuel type other than karri 4/5, Equations 21-25 are employed.

FORWARD RATES OF HEADFIRE SPREAD

Using the WA Fire Behaviour computer system (van Didden 1985; Beck 1987, 1988), fire danger indices and headfire spread rates are predicted for a number of fuel, stand and topographic conditions that are typical of a given locality, using relevant weather forecasts. This information is applied operationally, for example, to establish standby suppression crew requirements and aerial detection schedules (Burrows and Sneeuwjagt 1989).

Fire Danger Indices

Surface moisture content and wind speed are used to calculate a fire danger index (FDI) for jarrah and karri types by applying one of two models based on a standard northern jarrah (NJs) and karri 4/5 (Ks) fuel complex respectively. A fire danger index actually represents a forward rate of headfire spread (m h^{-1}) on level to undulating terrain given the following: stand conditions of northern jarrah and karri 4/5 effecting a 5:1 and 7:1 wind ratio respectively, on an open wind speed measured at (or forecasted for) a height of 15 m above the stand canopy; and an available fuel quantity of 7.5-8.5 and 15.0-19.0 t ha^{1} applying for northern jarrah and karri 4/5 respectively. The standard is intended to reflect the fuel quantity available in five-year-old fuels, which constitute those fuels that have accumulated during a five-year period since the last fire.

Inputs of surface moisture content and wind speed must be estimated for the time at which predictions are required. A fire danger index can be predicted at any time of the day, given inputs that are specific temporally. Planning activities are often carried out for worst case situations to maximize preparedness, and so a minimum SMC and an afternoon wind speed are often applied to predict a maximum FDI for the day.

A fire danger index for standard northern jarrah is calculated from:

$$FDI_{(NJs)} = Yj + Aj \exp(WIND_{fg}\ Nj) \qquad [27]$$

where

$Yj = 21.37 - 3.42\ SMC + 0.085\ SMC^2$

$Aj = 48.09\ SMC \exp(-0.60\ SMC) + 11.90$

$Nj = -0.0096\ SMC^{1.05} + 0.44$

$WIND_{fg}$ is the wind speed (km h^{-1}) at a height of 1-2 m above the ground in the forest.

Application Bounds

3.	<	SMC	<	27.
0.	<	$WIND_{fg}$	<	11.2

and for standard karri:

$$FDI_{(Ks)} = Yk + Ak \exp(WIND_{fg}\ Nk) \qquad [28]$$

where

$Yk = 4.88 - 263.78\ SMC^{-1.80}$

$Ak = 163.40\ SMC^{-1.18}$

$Nk = -0.0059\ SMC + 0.54$

Application Bounds

3.	<	SMC	<	25.
0.	<	$WIND_{fg}$	<	7.2

The wind speed required in Equation 27 or 28 can be measured directly, although an open wind speed provided by weather forecasts and tower measurements must be reduced by a wind ratio factor. Standard wind ratio factors (5 for northern jarrah and 7 for karri 4/5), which are assigned according to wind ratio, apply to predict an FDI. The appropriate wind ratio factor for non-standard conditions, which is selected using Table 2 for jarrah types and Table 3 for karri types, should be used to predict a ground forest wind speed:

$$WIND_{fg} = WIND_{t} / WIND_{rf} \qquad [29]$$

where

$WIND_{t}$ is the wind speed (km h^{-1}) that is measured at a fire tower at some height above the forest canopy as indicated by a selected wind ratio factor

$WIND_{rf}$ is the wind ratio factor that is assigned according to wind ratio.

To predict a forward rate of headfire spread, a FDI must be corrected if conditions of available fuel quantity or terrain slope, or both, differ from those otherwise assumed. For non-standard available fuel quantities, a FDI is multiplied by a fuel quantity correction factor to generate a forward rate of headfire spread on level to undulating terrain. This fuel corrected rate of spread is then adjusted for slope if topography is neither level nor undulating.

The original data, which were used to establish the FDI relationships and the fuel quantity correction factors, came from experimental fires that sustained combustion. The vast majority of these fires were conducted on level to undulating terrain, since this is the norm for the topography of the south-west of WA. Experimental fires over steep terrain, which might have had a significant impact on fire behaviour, were analysed separately. According to Sneeuwjagt (personal communication), these fires confirmed the slope corrections determined by McArthur (1967).

TABLE 2

Wind ratios (wind ratio factors) for jarrah fuel types (after Sneeuwjagt and Peet 1985).

FOREST TYPE AND CANOPY	WIND RATIOS TOWER HEIGHT ABOVE CANOPY (m)					
	0		15		30	
jarrah-wandoo						
60 per cent canopy						
Ridge	3:1	(3)	4:1	(4)	5:1	(5)
Lower Slopes	4:1	(4)	5:1	(5)	6:1	(6)
30 per cent canopy						
Ridge	2:1	(2)	3:1	(3)	4:1	(4)
Lower Slopes	3:1	(3)	4:1	(4)	5:1	(5)
Flats	1:1	(1)	1:1	(1)	2:1	(2)
pine plantations						
Dense Stands	5:1	(5)	6:1	(6)	6:1	(6)
Thinned Stands	3:1	(3)	4:1	(4)	5:1	(5)

TABLE 3

Average wind ratios (wind ratio factors) for southern forest types that have been derived from the table data provided by Sneeuwjagt and Peet (1985). Tower height is approximately 15 m above the canopy and 30 m above the ground.

FOREST TYPE	AVERAGE WIND RATIO	
southern jarrah	5.5:1	(5.5)
karri 3/6	6.0:1	(6.0)
karri 4/5	7.0:1	(7.0)
karri 1/2	9.0:1	(9.0)
karri regrowth	9.0:1	(9.0)

Bounds depicting the range of fuels, weather conditions and spread rates that were experienced during experimental fires are presented in Table 4. These bounds apply to both fire danger indices and to fuel corrected rates of headfire spread.

Original data bounds are not presented for wandoo since very few experimental fires have been conducted in this fuel type. Operational burns indicate that the jarrah and karri models are adequate for upslope and gully wandoo respectively (Sneeuwjagt, personal communication). Original data bounds for experimental fires in *Pinus pinaster* and *P. radiata* have been grouped because experimental fires in these two fuel types were conducted under similar conditions, although predictive relationships for the two pine species differ.

Experimental fire data were supplemented with data obtained from wildfires such as those discussed by Underwood *et al.* (1985). The range of fuel and weather conditions that were experienced during wildfires include and exceed those experienced during experimental fires. Rate of spread extremes for wildfires that have been considered by Sneeuwjagt and Peet (1985) are also presented in Table 4.

To derive a fuel-corrected rate of headfire spread, a fuel quantity correction factor is applied to a fire danger index. A fuel quantity correction factor is calculated from an available fuel quantity and a surface litter moisture content. The latter of these inputs can be determined *via* the moisture content prediction sub-system. In the next section methods of calculating available fuel quantity are given.

Available Fuel Quantities

An available fuel quantity represents the proportion of a fuel complex that is immediately available to burn in a fire. The available fuel quantity varies as a function of the weight and the moisture condition of a fuel bed, and it is determined by adding the available proportion of litter, trash, scrub and slash fuels for a given fuel complex.

An available fuel factor is used to reduce a total litter weight to that which is available for burning. Litter moisture contents are applied to predict an available fuel factor, and total litter weights can be obtained directly from field samples or predicted from fire history and stand characteristics.

Trash and scrub fuels associated with an understorey influence fire behaviour. The available proportion of these fuel bed components, which is determined according to broad classes of fuel dryness, is added to the available litter fuel, to derive an available fuel quantity.

Pine plantations do not contain scrub or trash components but constitute primarily needle-bed fuels. Thinning and pruning operations are conducted regularly in pines, and the proportion of residual needles and branches (slash fuels) that is available for burning is included in the available fuel quantity in addition to any available litter fuel.

TABLE 4

Original data bounds for experimental fires (extreme wildfire rates of spread) in northern jarrah, karri and pines. The data from these fires were used to derive the rate of spread relationships that are depicted in the forest fire behaviour tables for Western Australia (bound sources are given parentheses and these are detailed in Table 1). Lower bounds for wildfires are unknown.

VARIABLE	NORTHERN JARRAH (1,3,4,5)	KARRI (1)	PINES (1,4,6)
Surface Litter Moisture Content SMC (%)	3.0 - 25.0	6.0 - 25.0	5.0 - 40.0
Ground (1-2m) Forest Wind Speed $WIND_{fg}$ (kph)	1.2 - 10.0	1.0 - 7.0	0.8 - 10.5
Available Fuel Quantity AFQ (t ha^{-1})	1.5 - 15.0	5.0 - 55.0	0.5 - 18.0
Forward Rate of Spread ROS (m hr^{-1})	13 - 660 (3 200)	15 - 200 (2 500)	7 - 85 (1 000)

Available Litter

In forests, the top of a litter bed is normally drier than the bottom, and a moisture gradient exists by which litter moisture content increases from the surface to the bottom of a litter bed (Ward 1971; Luke and McArthur 1978). Ward (1971) illustrated that given a surface and profile moisture content, the moisture content at any depth within the litter bed could be defined. Having quantified moisture content with depth, the proportion of the litter bed with a moisture content below that of extinction, which is known as the available fuel factor (AFF), can be estimated. The available fuel factor can range from 0, which occurs when none of the litter fuel is available, to 1.0, which occurs when the entire litter bed is available.

Shallow litter beds (< 20 mm) under an open stand canopy do not generally exhibit a significant moisture gradient and the moisture content of such a litter bed is assumed to be uniform throughout. The SMC is said to be representative of the moisture content of shallow litter beds, which are typical of northern jarrah forests. If the SMC of a shallow litter bed is below the moisture content of extinction, the entire litter bed is said to be available and an available fuel factor of 1.0 is applied.

Prescribed burning for fuel reduction in northern jarrah is carried out throughout the State forests to maintain fuel loads below 6-8 t ha^{-1} (Underwood 1988). Primarily as a result of this fuel reduction policy, which has been in effect since 1954 (Underwood *et al.* 1985), litter fuels of northern jarrah and upslope wandoo are typically less than 20 mm in depth, and hence a function to derive an available fuel factor from SMC and PMC has not been required for these fuel complexes. On the other hand, litter beds of karri types are typically in excess of 20 mm because they accumulate litter fuels rapidly, and so an available fuel factor must be determined for karri types.

For karri types, an available fuel factor (AFF) can be calculated for any time of the day using moisture contents that are time specific. The available fuel factor for the litter of karri types, which has an extinction moisture content of approximately 25 per cent, is:

$$AFF_{(K)} = 1.0 - (1.0 / (1.0 + P \exp(Q\ PMC)) + R) \qquad [30]$$

where

$P = 0.43 \exp(0.23\ SMC) + 2.0$

$Q = -0.0085\ SMC + 0.024$

$R = 0.013\ SMC - 0.43$

Application Bounds					Original Data[1]				
10.	<	PMC	<	200.	10.	<	PMC	<	150.
3.	<	SMC	<	30.	6.	<	SMC	<	25.

For pine litter with an extinction moisture content of approximately 30 per cent, the available fuel factor is:

$$AFF_{(PP/PR)} = 1.0 - (1.0 / (1.0 + U \exp(V\ PMC)) + N) \qquad [31]$$

where

$U = 1.07 \exp(SMC\ 0.12)$

$V = -0.00033\ (SMC / 9.77)^{4.20} - 0.045$

$N = (1.67\ SMC / (SMC + 5.79)) - 1.56$

Application Bounds					Original Data[1]
30.	<	PMC	<	200.	As applied
5.	<	SMC	<	40.	

The total litter weight, to which an AFF is applied, is calculated next. One of two methods is used to obtain total litter weight. The first method, which employs input parameters that are obtained readily, is used to predict total litter weight, L (t ha^{-1}), from canopy cover, CC (%), and the number of annual leaf falls that have occurred since the last fire, LF. This first method is used primarily to estimate litter weights for predictions of wildfire behaviour characteristics, when detailed field survey information is unavailable:

$$L_{(NJ)} = (0.18\ CC + 11.06)\ (1. - \exp(-0.086\ LF)) \qquad [32]$$

Application Bounds					Original Data[7,8]				
1.	<	LF	<	25.	1.	<	LF	<	30.
20.	<	CC	<	80.	10.	<	CC	<	80.
					1.	<	$L_{(NJ)}$	<	21.

$$L_{(K/SJ)} = (0.43\ CC + 22.59)\ (1. - \exp(-0.085\ LF)) \qquad [33]$$

Application Bounds					Original Data[1]				
1.	<	LF	<	25.	1.	<	LF	<	25.
30.	<	CC	<	100.	40.	<	CC	<	75.
					5.	<	$L_{(K)}$	<	45.

$$L_{(W)} = (0.17\ CC + 1.74)\ (1. - \exp(-0.098\ LF)) \qquad [34]$$

Application Bounds					Original Data[1,9]				
1.	<	LF	<	30.	1.	<	LF	<	46.
20.	<	CC	<	80.	CCs are rough estimates				
					0.2	<	$L_{(W)}$	<	52.

The second and more accurate method is used to estimate litter weights when greater accuracy is required to support prescribed burning, for example. Field measurements of litter depth, DP (mm), can be used to estimate total litter weight:

	Application Bounds	Original Data[1,9]	
$L_{(K)} = 0.64$ DP	0. < DP < 100.	10. < DP < 90.	[35]
$L_{(M)} = 0.49$ DP	0. < DP < 55.	5. < DP < 40.	[36]
$L_{(NJ/SJ)} = 0.53$ DP	0. < DP < 55.	5. < DP < 30.	[37]
$L_{(PP)} = 0.47$ DP	0. < DP < 100.	5. < DP < 100.	[38]
$L_{(PR)} = 0.39$ DP	0. < DP < 100.	5. < DP < 60.	[39]
$L_{(W)} = 0.87$ DP	0. < DP < 35.	2. < DP < 24.	[40]

Once the available fuel factor and the total litter weight have been determined for a given fuel type, the weight of available litter, La (t ha^{-1}), is calculated:

$$La = L\ AFF \qquad [41]$$

Available Trash

Dead tree branches and scrub debris, which are known collectively as trash, are common in karri type fuel complexes. Available trash is added to any available litter and scrub fuels to derive total available fuel. One of two trash weights is used to depict an available trash weight, and each of these is derived as a function of trash depth and density (Sneeuwjagt 1973). The amount of available trash, Tra (t ha^{-1}), is assumed equal to the total weight of trash (Trtot) when prevailing weather conditions are expected to result in intense wildfires (SMC < 6), or the weight of trash material that is less than 10 mm in diameter (Trav) is assumed for average conditions of prescribed burning and mild to moderate wildfires (SMC > 6). Trtot and Trav are given by Equations 42 and 43 respectively:

$$Trtot = (60.27 - 10.71\ Tdf)\ Tdepth + (1.0 - 0.041\ Tdf) \qquad [42]$$

$$Trav = (35.35 - 7.76\ Tdf)\ Tdepth + (0.71 - 0.38\ Tdf) \qquad [43]$$

where

Tdepth is the average depth of trash (m), which is the ceiling level that excludes irregularities caused by the occasional tall, dead, individual upright branch or scrub stem (Sneeuwjagt 1973)

Tdf is a trash density factor that is assigned a value of 0, 1 or 2 for dense, medium and sparse trash density classes respectively. Trash density ratings are assigned subjectively: dense trash is found normally in karri types that have not been burnt for 10 or more years; sparse trash is common in karri types that have not been burnt for 5-10 years, and jarrah fuels less than 10 years of age are not apt to carry a significant trash component

Applications Bounds					Original Data[10]				
0.1	<	Tdepth	<	1.5	0.2	<	Tdepth	<	1.6
0.	<	Tdf	<	2.	0.	<	Tdf	<	2.
					8.0	<	Trtot	<	98.
					3.0	<	Trav	<	59.

Available Scrub

Sneeuwjagt (1971a, 1971b, 1973) described six scrub structural types and presented techniques for measuring scrub structure and quantity. Using these field measurement techniques, a height-density profile for a given scrub structural type is assigned (Fig. 2). Scrub weights are estimated from shrub density profiles using the relevant expected height of fuel consumption.

One of three component weights can be assumed to depict an available scrub weight: a total scrub biomass that includes the weight of all branches and foliage is assumed when conditions are expected to result in a high intensity wildfire; a total foliage weight is assumed when conditions are expected to result in a fire of moderate intensity; and the weight of low foliage (< 1.5 m) is assumed when conditions are expected to result in a fire of low intensity. Component weights are determined as a function of scrub density and average scrub top height, Sht (m), and a fire intensity factor, If, is used to identify the applicable scrub weight, SWT (t ha^{-1}): an If of 0, 1 or 2 is assigned for fires that are expected to burn with a high, moderate or low intensity thereby consuming a total scrub, total foliage or partial foliage component respectively:

$$SWT_{(S1)} = (1 - If^{0.36}/1.30)(41.80/(1 + 1117.27\ \exp(-1.44\ Sht)))(1 - Sdf^{1.07}/8.84) \qquad [44]$$

$$SWT_{(S2)} = (1 - If^{0.25}/1.26)(54.96/(1 + 48.82\ \exp(-0.86\ Sht)))(1 - Sdf^{0.93}/8.36) \qquad [45]$$

$$SWT_{(S3)} = (1 - If^{0.36}/1.52)(23.51/(1 + 19.11\ \exp(-1.25\ Sht)))(1 - Sdf^{0.80}/3.34) \qquad [46]$$

$$SWT_{(S4)} = (1 - If^{0.23}/1.24)\ (5.19\ \exp(0.33\ Sht))\ (1 - Sdf^{0.84}/3.87) \qquad [47]$$

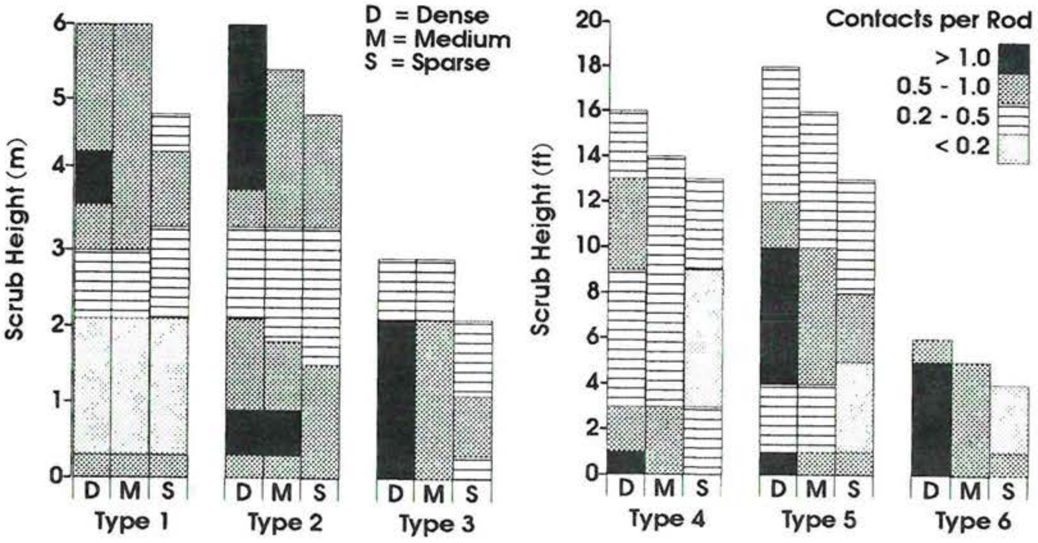

Figure 2. Height-density profiles for six standard structural types (reproduced from Sneeuwjagt and Peet 1985).

$$SWT_{(S5)} = (1 - If^{0.19}/1.23)\ (3.10 \exp(0.44\ Sht))\ (1 - Sdf^{1.06}/5.08) \quad [48]$$

$$SWT_{(S6)} = (1 - If^{0.58}/2.53)\ (1.29 \exp(1.12\ Sht))\ (1 - Sdf^{0.86}/4.46) \quad [49]$$

where

Sdf is a scrub density factor that is assigned a value of 0, 1 or 2 for dense, medium and sparse scrub density classes, respectively.

	Application Bounds					Original Data[1]				
S1	5.0	<	Sht	<	7.0	4.5	<	Sht	<	7.0
S2	5.0	<	Sht	<	7.0	4.5	<	Sht	<	7.0
S3	1.5	<	Sht	<	3.0	1.3	<	Sht	<	3.5
S4	3.5	<	Sht	<	5.5	3.0	<	Sht	<	6.0
S5	3.5	<	Sht	<	5.5	3.0	<	Sht	<	6.0
S6	0.6	<	Sht	<	1.5	0.5	<	Sht	<	1.8

A scrub flammability factor (SFF), which is assigned using Table 5, is applied to allow for scrub fuels that are non-standard in arrangement. According to Sneeuwjagt (personal communication), the SFF is a crude weighting factor that is applied to scrub loading, although a SFF of 1.0 is normally applied.

The available scrub weight, Sa (t ha^{-1}), is the product of the SWT and a scrub flammability factor SFF:

$$Sa = SWT\ SFF \quad [50]$$

Available Slash

Although pine plantations do not carry significant trash or scrub components, additional fuels must be considered in pine plantations that have been thinned or pruned. Residual materials (slash fuels) that are left on site consist of stem wood, branch wood and aerated needles. It has been recognized that although thinning and pruning operations reduce the likelihood of crown fires, slash fuels themselves present a fire hazard (McCormick 1973; Burrows 1980; Burrows *et al.* 1988). Prescribed burns can be conducted to remove these fuels if conditions of weather and fuels are such that aerated needles and light branchwood (< 25 mm in diameter) can be consumed without damaging crop trees.

Table 7.5 (Sneeuwjagt and Peet 1985), which is used to quantify the slash fuels of *Pinus radiata* plantations that have been thinned or pruned, has been developed primarily to support such prescribed burns, although it represents a simplification of the work of Burrows and others (Burrows 1980; Burrows *et al.* 1988). Burrows (1980) presented accurate techniques for quantifying the slash fuels of *P. radiata* from average residual top butt diameter and the number of stems removed. Original table data were derived from the relationships that were established by Burrows (1980) by assuming an average butt diameter of 14 cm for an 11-year-old stand that had been thinned commercially. Experimental fires in 14-year-old plantations that had been thinned were conducted without damaging crop trees (Burrows *et al.* 1988), and it was concluded that successful burns could be attained given the following conditions: fire intensities should be less than 200 kW m^{-1}; AMCs must be less than 27 per cent; the soil dryness index (SDI), which was developed by Mount (1972) and adapted for WA by Burrows (1987), should be less than 250 units in the winter or spring, or have fallen by 400 units from its summer maximum in the autumn; the available litter bed should not exceed 3 t ha^{-1}; and the total

TABLE 5

Scrub flammability factors (reproduced from Sneeuwjagt and Peet 1985)

SCRUB FLAMMABILITY	SCRUB FOLIAGE CONDITION		
	YOUNG/GREEN	20% DEAD	50% DEAD
LOW Foliage dispersed; coarse; Sparse; compacted or moist.	0.5	1.0	1.5
MEDIUM Foliage moderately fine; mixed size classes; medium dense;	1.0	2.0	3.0
HIGH Foliage aerated; fine; dense or continuous	1.5	3.0	5.0

available fuel quantity should not exceed 10 t ha^{-1}. These conditions are expected to remove 20 per cent of the total branchwood, Btot, and this fraction of the total represents the available branchwood, Bav, for such low intensity fires.

When an AMC, which is estimated using Equation 20, is less than 27 per cent, all aerated needles are considered to be available for burning. Aerated needles can be fresh or grey depending on the time since thinning or pruning: fresh aerated needles are reddish-brown in colour and have been dead for up to one year, and grey aerated needles have been dead for one to two years. The weight of grey needles (Ng) is 60 per cent that of fresh needles (Nf), which are produced by removing a given number of stems per hectare, SR, in the first commercial thinning treatment of a 10- to 14-year-old plantation of *P. radiata*.

When a plantation has been thinned, the available aerated needle weight, Na (t ha^{-1}), is equal to either Nf or Ng for material that is fresh or grey respectively, and the weight of available branchwood, Ba (t ha^{-1}), is equal to Bav for prescribed burning and mild wildfire conditions, or Btot is assumed for extreme wildfire conditions. In terms of the number of stems per hectare removed, the required available weights are:

$$Nf_{(PR)} = SR\ 0.0085 \quad [51]$$

$$Ng_{(PR)} = SR\ 0.005 \quad [52]$$

$$Bav_{(PR)} = SR\ 0.002 \quad [53]$$

$$Btot_{(PR)} = SR\ 0.01 \quad [54]$$

and the following quantities are assumed when only pruning occurs:

$$Nf_{(PR)} = 3.0$$

$$Ng_{(PR)} = 1.8$$

$$Bav_{(PR)} = 0.7$$

$$Btot_{(PR)} = 3.0$$

Application Bounds	Original Data l[1]
200. < SR < 800.	200. < SR < 750.

No relationships have as yet been established for *P. pinaster* and, according to Sneeuwjagt (personal communication), for the present it is assumed that the tables for *P. radiata* work adequately for *P. pinaster*.

Given that available litter, trash, scrub and slash fuels have been determined, the total available fuel quantity, AFQ (t ha^{-1}), is determined by adding the weights of the appropriate fuel bed components for a given fuel complex. For example, the AFQ for a northern jarrah type that contains litter, scrub and no trash is:

$$AFQ_{(NJ)} = La_{(NJ)} + Sa_{(S6)} \quad [55]$$

The AFQ for a *P. radiata* type that has been thinned recently is calculated from:

$$AFQ_{(PR)} = La_{(PR)} + Na_{(PR)} + Ba_{(PR)} \quad [56]$$

For a karri type with an understorey of scrub structural type 1, the AFQ is comprised of litter, trash and scrub fuel components:

$$AFQ_{(K)} = La_{(K)} + Ta_{(K)} + Sa_{(S1)} \quad [57]$$

Fuel Quantity Correction Factors

The forward rate of spread of a fire on level to undulating terrain is determined by adjusting a fire danger index for non-standard fuel quantities by way of a fuel quantity correction factor (FQCF). Fuel quantity correction factors are derived from the AFQ and SMC of a given fuel type, and there are separate fuel correction factors for eucalypt forests and pine plantations.

Trends in the table data given by Sneeuwjagt and Peet (1985) illustrate that for jarrah and karri fuel types, there is a threshold value for AFQ below which SMC does not exhibit a direct influence on the FQCF. This portion of both the jarrah hardwood and karri FQCF tables is a theoretical solution that was developed by Sneeuwjagt (personal communication).

The FQCF varies with SMC and AFQ above this threshold AFQ, but attempts to fit a single, accurate function to this portion of the table data failed. Trends given by the table data indicate that FQCFs should increase with decreasing SMCs for a given AFQ, although convergence problems were encountered. These were probably encountered because of the sparsity of SMC data; only three broad categories of SMCs are given in the tables.

Instead of a single function, three equations are presented, one for each SMC class, whereby FQCF varies with AFQ. For northern jarrah and upslope wandoo, fuel quantity correction factors are calculated from:

Application Bounds

$$FQCF_{(NJ/W)} = 1.02 / (1 + 7266.83 \exp(-1.36\, AFQ_{(NJ/W)})) + 0.10 \qquad 2.5 < AFQ_{(NJ/W)} < 8.0;\ 3.0 < SMC < 26.0 \qquad [58a]$$

$$FQCF_{(NJ/W)} = (6.03 + 5.81\, AFQ_{(NJ/W)}) / 53.44 \qquad 8.1 < AFQ_{(NJ/W)} < 25.0;\ 3.0 < SMC < 9.0 \qquad [58b]$$

$$FQCF_{(NJ/W)} = (11.19 + 2.92\, AFQ_{(NJ/W)}) / 35.02 \qquad 8.1 < AFO_{(NJ/W)} < 25.0;\ 9.1 < SMC < 18. \qquad [58c]$$

$$FQCF_{(NJ/W)} = (0.055 + 0.0023\, AFQ_{(NJ/W)}) / 0.074 \qquad 8.1 < AFO_{(NJ/W)} < 25.0;\ 18.1 < SMC < 26.0 \qquad [58d]$$

Original Data[1,4,5]

$1.5 < AFQ_{(NJ/W)} < 15.$

$3. < SMC < 25.$

and for karri types, fuel quantity correction factors are:

Application Bounds

$$FQCF_{(K)} = 0.95 / (1 + 957.74 \exp(-0.52\, AFQ_{(K)})) + 0.16 \qquad 5.0 < AFQ_{(K)} < 17.0;\ 3.0 < SMC < 26.0 \qquad [59a]$$

$$FQCF_{(K)} = (5.08 + 6.26\, AFQ_{(K)}) / 111.50 \qquad 17.1 < AFQ_{(K)} < 64.0;\ 3.0 < SMC < 9.9 \qquad [59b]$$

$$FQCF_{(K)} = (17.35 + 1.70\, AFQ_{(K)}) / 46.25 \qquad 17.1 < AFQ_{(K)} < 64.0;\ 10.0 < SMC < 18.9 \qquad [59c]$$

$$FQCF_{(K)} = (10.88 + 0.46\, AFQ_{(K)}) / 18.70 \qquad 17.1 < AFQ_{(K)} < 64.0;\ 19.0 < SMC < 26.0 \qquad [59d]$$

Original Data[1]

$5. < AFQ_{(K)} < 55.$

$6 < SMC < 25.$

A single function was derived successfully to describe the FQCFs of each of the pine fuel types, for which eight classes of surface moisture content are given in the tables:

Application Bounds

$$FQCF_{(PP)} = AFQ_{(PP)}(-0.0061\, SMC + 0.24) + (1.28 - 0.49 / (1 + 38.96 \exp(-0.25\, SMC))) \qquad 4. < AFQ < 25.;\ 3. < SMC < 40. \qquad [60]$$

Application Bounds

$$FQCF_{(PR)} = AFQ_{(PR)}(-0.0065\, SMC + 0.21) + (1.31 - 0.47 / (1 + 33.99 \exp(-0.36\, SMC))) \qquad 4. < AFQ < 25;\ 3. < SMC < 35 \qquad [61]$$

Original Data[1,4,6]

$0.5 < AFQ_{(PP/PR)} < 18.$

$5. < SMC < 40.$

Fuel and Slope Corrected Spread Rates

A FQCF is applied to the appropriate FDI, which is $FDI_{(NJs)}$ for jarrah fuel types and $FDI_{(Ks)}$ for karri fuel types, to determine the fuel corrected forward rate of headfire spread over level to undulating terrain, ROS (m h^{-1}), calculated using the SMC for a given time and fuel type. Note that the original data bounds presented in Table 4 apply to these rates of spread.

Equations 62, 63 and 64 are examples of ROS calculations for non-standard northern jarrah, *P. radiata* and karri 1/2 fuel types respectively:

$$ROS_{(NJ)} = FQCF_{(NJ)}\, FDI_{(NJs)} \qquad [62]$$

$$ROS_{(PR)} = FQCF_{(PR)}\, FDI_{(NJs)} \qquad [63]$$

$$ROS_{(K12)} = FQCF_{(K)}\, FDI_{(Ks)} \qquad [64]$$

The forward rate of headfire spread for a given fuel type must be corrected for slope if the local topography is neither level nor undulating. The table data presented by Sneeuwjagt and Peet (1985) reproduce the work of McArthur (1967), for which Noble *et al.* (1980) derived Equation 65. Hence, the forward rate of spread of a fire on terrain of slope θ degrees, ROS_θ, is:

$$ROS_\theta = ROS \exp(0.069\, \theta) \qquad [65]$$

Application Bounds

$-10. < \theta < 20.$

SCORCH HEIGHTS

Planning activities that support fuel reduction include prescribing conditions that will yield acceptable canopy scorch heights. Maximum scorch heights can be calculated for jarrah or karri types, although scorch heights for each type are predicted using separate and quite different relationships.

From the results of low intensity spring and autumn fires that were lit in northern jarrah, Peet (1963) developed linear relationships to predict average flame height from average rate of spread, and then average scorch height from flame height. Peet's (1963) linear relationships showed that autumn scorch heights were approximately 1.8 times greater than those incurred in the spring. However, it was found that field personnel were underestimating potential scorch height using these relationships (Burrows[5], personal communication), and so further research was conducted.

[5] N.D. Burrows, Senior Research Scientist, Science and Information Division, Department of Conservation and Land Management, Como WA.

Preliminary results of experimental fires in jarrah that were conducted by Burrows (personal communication) suggest that scorch height under peak conditions of summer drying is approximately double the average as calculated by Peet for spring scorch heights. As a result of Burrows' work, a new relationship was derived to predict maximum scorch height from rate of spread and total available fuel quantity. It is assumed at present that these relationships are adequate for predicting scorch heights for pines.

The scorch height equations for jarrah types were developed from spread rates that are relatively low. Indeed the tables, and therefore the equations, are limited to predicting maximum scorch height when fuel and weather conditions are typical of mild intensity fires:

$$SCORCHsp_{(J)} = 0.17\ ROS_\theta + 1.29 \quad [66a]$$

$$SCORCHau_{(J)} = 0.306\ ROS_\theta + 2.322 \quad [66b]$$

where

SCORCHsp is the maximum scorch height, for a given fuel type, in the spring when the SDI is less than 800 units

SCORCHau is the maximum scorch height, for a given fuel type, in the autumn when the SDI is greater than 800 units

Application Bounds					Original Data[12]				
8.	<	ROS_θ	<	68.	10.	<	ROS_θ	<	75.
4.	<	$AFQ_{(J)}$	<	16.	5.	<	$AFQ_{(J)}$	<	18.
50.	<	CC	<	70.	50.	<	CC	<	70.
					0.6	<	$SCORCHsp_{(J)}$	<	8.5
					0.6	<	$SCORCHau_{(J)}$	<	24.4

For karri types, Sneeuwjagt (personal communication) established relationships to predict maximum scorch height from fire intensity, as defined by Byram (1959). Using the table given by Sneeuwjagt and Peet (1985), fire intensity is implied given a ROS_θ and an AFQ. Sneeuwjagt (personal communication) also found that maximum scorch heights in the autumn were approximately 1.8 time those incurred in the spring:

$$SCORCHsp_{(K)} = 0.19\ ROS_\theta + (-30.44 \exp(-0.0082\ AFQ_{(K)}) + 28.98) \quad [67a]$$

$$SCORCHau_{(K)} = 0.342\ ROS_\theta + (52.16 - 54.79 \exp(-0.0082\ AFQ_{(K)})) \quad [67b]$$

Application Bounds					Original Data[1]				
10.	<	ROS_θ	<	112.	15.	<	ROS_θ	<	200.
5.	<	$AFQ_{(K)}$	<	53.	5.	<	$AFQ_{(K)}$	<	55.
					1.	<	$SCORCHsp_{(K)}$	<	31.
					1.	<	$SCORCHau_{(K)}$	<	63.

AVAILABLE BURNING HOURS

The implementation of a prescribed burn for fuel reduction is supported by predictions of the time at which fuel moisture content is such that ignition could occur, and the amount of time during which fire spread, intensity and scorch conditions are likely to be safe and effective. In general, adequate conditions for fuel reduction burning are said to occur when the SMC of hardwood litter fuels is between 10 and 18 per cent.

When the surface moisture content is predicted to have decreased from the 0800 maximum to less than 18 per cent, safe and effective prescribed burning can start, STARTt (decimal hours) given by:

$$STARTt = 14.5 / (1 + 10228.05\ SMCa^{-3.08}) + 7.57 \quad [68]$$

The time (decimal hours) that is available for prescribed burning a given fuel type in the autumn, $BHava_{(NJ/K)}$, or in the spring, $BHavs_{(NJ/K)}$, which assumes that lighting commences at STARTt, is calculated from:

$$BHava_{(J)} = 17.46 - 25.78 / (1 + 1801.18\ SMCa^{-2.70}) \quad [69]$$

$$BHavs_{(J)} = 14.35 - 25.36 / (1 + 3022.76\ SMCa^{-2.78}) \quad [70]$$

$$BHava_{(K)} = 13.02 - 14.34 / (1 + 137212.87\ SMCa^{-4.51}) \quad [71]$$

$$BHavs_{(K)} = 12.02 - 14.34 / (1 + 137209.12\ SMCa^{-4.51}) \quad [72]$$

Application Bounds					Original Data
8.	<	SMCa	<	20.	Unknown
0.	<	BHava/BHavs			

Equations 68-72 have been fitted to the table data provided by Sneeuwjagt and Peet (1985), although continuous predictions of day-time SMCs, which can be predicted using Equations 26a and 26b, could also be employed to predict start time and available burning hours. The latter method has never been used operationally.

COMPARISON OF TABLE DATA AND EQUATION PREDICTIONS

Each equation has been evaluated for its ability to predict the table data from which it was derived. A root mean square error (RMSE), a coefficient of determination (R^2) and a mean residual (MRE) have been calculated for each equation (Table 6). The MRE yields information about the tendency of the model to under or over estimate, although a small value does not necessarily indicate a good model. It should be noted that the magnitude of a RMSE or a MRE is scale dependent, hence these values are only useful in comparing models which predict the same variable.

TABLE 6
The root mean squared errors (RMSE[a]), mean residual (MRE[b]) and, where applicable, coefficients of determination (R^2) obtained after fitting equations to each of the forest fire behaviour tables for Western Australia.

EQUATION	VARIABLE	TABLE[c]	RME	AME	R^2	UNIT
1	$NWCs/p_{(wet)}$	4.3.1	1.74	0.33	0.99	%
2	$NWCs/p_{(dry)}$	4.3.2	1.21	-1.01	0.99	%
4	Tz	8.1	0.85	0.02	0.99	°C
7	BDU	4.3.3	0.48	-0.28	0.99	-
8	$DDCs_{(NJ)}$	4.3.4	0.40	0.01	0.99	%
10	$DDCP_{(K45)}$	5.3.1	0.33	-0.06	0.99	%
12	$SMCa/z_{(SJ)}$	4.3.5	0.31	0.06	0.99	%
13	$SMCa/z_{(K36)}$	4.3.5	0.28	0.04	0.99	%
14	$SMCa/z_{(K45)}$	4.3.5	0.32	-0.04	0.99	%
15	$SMCa/z_{(K12)}$	4.3.5	0.36	0.03	0.99	%
16	$SMCa/z_{(OS)}$	4.3.5	0.25	-0.01	0.99	%
17	$SMCa/z_{(PP)}$	4.3.6	0.56	0.19	0.99	%
18	$AMCa/z_{(PP)}$	4.3.6	0.40	-0.14	0.99	%
19	$SMCa/z_{(PR)}$	4.3.6	0.39	0.10	0.99	%
20	$AMCa/z_{(PR)}$	4.3.6	0.42	-0.06	0.99	%
21	$PMCa/z_{(SJ)}$	5.3.2	0.34	0.22	0.99	%
22	$PMCa/z_{(K36)}$	5.3.2	0.46	-0.17	0.99	%
23	$PMCa/z_{(K12)}$	5.3.2	1.16	0.02	0.99	%
24	$PMCa/z_{(PP)}$	5.3.2	0.54	0.01	0.99	%
25	$PMCa/z_{(PR)}$	5.3.2	1.87	-0.08	0.99	%
27a	$FDI_{(NJs)}$	6.7	15.07	0.36	0.99	$m\ h^{-1}$
27	$FDI_{(NJs)}$	6.7	19.01	6.57	0.99	$m\ h^{-1}$
28a	$FDI_{(Ks)}$	6.12	15.99	-2.18	0.99	$m\ h^{-1}$
28	$FDI_{(Ks)}$	6.12	12.39	1.42	0.99	$m\ h^{-1}$
30	$AFF_{(K)}$	5.4.1H	0.07	-0.01	0.99	-
31	$AFF_{(PP/PR)}$	5.4.1P	0.08	-0.01	0.99	-
32	$L_{(NJ)}$	7.1.1	0.86	0.11	0.97	$t\ ha^{-1}$
33	$L_{(K/SJ)}$	7.1.2	1.98	0.43	0.97	$t\ ha^{-1}$
34	$L_{(W)}$	7.1.3	0.50	0.03	0.98	$t\ ha^{-1}$
35	$L_{(K)}$	7.2.1	0.98	-0.79	0.99	$t\ ha^{-1}$
36	$L_{(M)}$	7.2.1	0.40	0.18	0.99	$t\ ha^{-1}$
37	$L_{(NJ/SJ)}$	7.2.1	0.27	0.10	0.99	$t\ ha^{-1}$
38	$L_{(PP)}$	7.2.1	0.93	0.32	0.99	$t\ ha^{-1}$
39	$L_{(PR)}$	7.2.1	0.91	0.40	0.99	$t\ ha^{-1}$
40	$L_{(W)}$	7.2.1	0.25	0.09	0.99	$t\ ha^{-1}$
42	Trtot	7.3.1	2.59	-0.74	0.99	$t\ ha^{-1}$
43	Trav	7.3.1	1.39	-0.37	0.99	$t\ ha^{-1}$
44	SWT(S1)	7.4.1	0.24	-0.01	0.98	$t\ ha^{-1}$
45	SWT(S2)	7.4.1	0.37	0.01	0.99	$t\ ha^{-1}$
46	SWT(S3)	7.4.1	0.57	0.15	0.98	$t\ ha^{-1}$
47	SWT(S4)	7.4.1	0.82	-0.02	0.99	$t\ ha^{-1}$
48	SWT(S5)	7.4.1	0.38	0.04	0.99	$t\ ha^{-1}$
49	SWT(S6)	7.4.1	0.29	0.06	0.95	$t\ ha^{-1}$
51	$Nf_{(PR)}$	7.5	0.03	-0.02	0.99	$t\ ha^{-1}$
52	$Ng_{(PR)}$	7.5	0.00	0.00	1.0	$t\ ha^{-1}$
53	$Bav_{(PR)}$	7.5	0.00	0.00	1.0	$t\ ha^{-1}$
54	$Btot_{(PR)}$	7.5	0.00	0.00	1.0	$t\ ha^{-1}$
58a & 58b	$FQCF_{(NJ/W)}$	6.8	0.17	0.13	0.99	-
58a & 58c	$FQCF_{(NJ/W)}$	6.8	0.02	0.01	0.99	-
58a & 58d	$FQCF_{(NJ/W)}$	6.8	0.05	0.03	0.99	-
59a & 59b	$FQCF_{(K)}$	6.13	0.02	0.01	0.99	-
59a & 59c	$FQCF_{(K)}$	6.13	0.04	0.01	0.99	-
59a & 59d	$FQCF_{(K)}$	6.13	0.03	0.01	0.99	-
60	$FQCF_{(PP)}$	6.9	0.22	-0.04	0.99	-
61	$FQCF_{(PR)}$	6.9	0.23	0.05	0.99	-
66a & 66b	$SCORCHsp/au_{(J)}$	6.14.1	0.68	-0.12	0.99	m
67a & 67b	$SCORCHsp/au_{(K)}$	6.14.2	2.13	-0.34	0.97	m
68	STARTt	7.7.1	0.20	-0.01	0.99	h
69	$BHava_{(J)}$	7.7.1	0.32	-0.05	0.99	h
70	$BHavs_{(J)}$	7.7.1	0.27	0.01	0.99	h
71	$BHava_{(K)}$	7.7.1	0.28	-0.03	0.99	h
72	$BHavs_{(K)}$	7.7.1	0.28	-0.04	0.99	h

[a] $RMSE = (\Sigma(Xio - Xip)^2 / n)^{0.5}$
[b] $MRE = \Sigma(Xio - Xip) / n$
where n is the number of observations and Xio (Xip) denotes the ith observation of the observed table (equation predicted) values.
[c] Table numbers refer to Sneeuwjagt and Peet (1985)

Using the equations, the table data are reproduced almost exactly if predictions are expressed with precisions equivalent to those depicted in the tables. Error terms include differences between the decimal precision of the equation predictions and the integer precision of the table data.

Equations that describe linear relationships illustrated extremely strong coefficients of determination (Table 6). In the worst case, 99 per cent of the variation in the predicted table variable is accounted for by the linear relationship with a given input variable.

The equations used to predict fire danger indices (Equations 27 and 28), which are the crux of the fire behaviour prediction system, have been investigated further. In an initial analysis, fire danger indices were predicted solely as a function of ground wind speed, by holding surface moisture content constant. This stage of the analysis proved that table data were best described as a function of wind speed using a modified exponential equation. A modified exponential fit the table data better than any of the many other equation forms tested, and so it was parametrized for each SMC. In lieu of deriving Yj/k, Aj/k and Nj/k in Equations 27 and 28 as a function of SMC, best fit is obtained using the parameters thereof, which are given in Table 7. In effect, the parameters given in Table 7 can be used to replace Equations 27 and 28 with twenty-one and twenty-three new equations respectively.

Error terms for each of the modified exponential equations particular to a given SMC, are presented in Table 7, along with the errors obtained when all of these equations are used in combination to predict the values that are given by Sneeuwjagt and Peet (1985). Error terms illustrate that the accuracy of the equations that were parametrized for each SMC, decreases with increasing SMC, and close examination of the table data explains why this is so.

The precision of the data expressed in the forest fire behaviour tables decreases with increasing fire danger index: fire danger indices between approximately 1-100, 100-300, 300-1000 and greater than 1000 are expressed to the nearest 1, 5, 10 and 50 m h^{-1}, respectively. The frequency of high FDIs increases with decreasing SMC, and so rounding errors will also increase with decreasing SMC. In essence, the table data depict that the error in predicted forward rates of headfire spread (FDI) increases with increasing wind speed and decreasing surface moisture content. Indeed our ability to predict fire behaviour characteristics decreases with the advent of extreme conditions. Weighted fitting techniques have therefore been used to favour those data with small errors.

A variance (σ^2) is required to calculate a weight for a given FDI. Assuming errors are roughly uniformly distributed over a range, the variance over these table data can be estimated from:

$$\sigma^2 = a^2 / 3.0 \qquad [73]$$

The variance has been calculated from estimates of **a** given by 0.5, 2.5, 5.0 and 25.0 for FDIs from 0-100, 101-300, 301-1000 and 1000+, respectively, and models have been developed to estimate the variance (Si^2) for each cell of the table as a function of wind speed and surface moisture content. Using the standard statistical equation (Myers 1989) to predict weights (Wi):

$$Wi = 1/Si^2/(\Sigma\ 1/Si^2) \qquad [74]$$

and replacing Si^2 with the models derived and $\Sigma\ 1/Si^2$ with the values calculated, the following were used to weight the table data for standard northern jarrah and standard karri respectively:

$$Wi = 1 / \exp (4.08 + 0.20\ SMC - 2.68\ SMC^{0.5} + 0.037\ WIND^2) / 2849.15 \qquad [75a]$$

$$Wi = 1 / \exp (2.72 + 0.14\ SMC - 2.04\ SMC^{0.5} + 0.066\ WIND^2) / 2085.42 \qquad [75b]$$

A non-linear, iterative weighting procedure in SAS (SAS Institute Inc. 1985) was used to parametrize the equations. Hence, Equations 27 and 28 should be replaced with the following:

$$FDI_{(NJs)} = Yj + Aj \exp (WIND_{fg}\ Nj) \qquad [27a]$$

where

$Yj = 27.29 - 2.38\ SMC + 0.045\ SMC^2$

$Aj = 47.56\ SMC \exp(-0.58\ SMC) + 6.67$

$Nj = -0.0013\ SMC^{1.60} + 0.43$

and

$$FDI_{(Ks)} = Yk + Ak \exp (WIND_{fg}\ Nk) \qquad [28a]$$

where

$Yk = 3.39 - 155.41\ SMC^{-3.34}$

$Ak = 103.95\ SMC^{-1.04}$

$Nk = -0.0084\ SMC + 0.59$

The combined errors obtained using the models parametrized by SMC (Table 7) can be compared with those obtained using Equations 27a and 28a. The accuracy with which the table data are predicted is not improved greatly by applying twenty-one (RMSE=9.64, MRE=4.73) and twenty-three (RMSE=12.70, MRE=5.45) models in lieu of Equations 27a (RMSE=15.07, MRE=5.60) and 28a (RMSE=15.99, MRE=5.98) respectively. It should also be noted that Equation 28a is not an improvement on the original Equation 28.

Despite the relative size of the error terms of Equations 27a and 28a, these equations should predict table data with an accuracy sufficient for the application of most predictions. Any increase in accuracy generated as a result of producing one equation to predict a fire danger index for each SMC as a function of wind speed, is not apt to justify using 44 equations in lieu of two. Indeed the combined errors given in Table 7 illustrate that a relatively large error is inherent despite the technique employed to calculate a fire danger index.

TABLE 7

The parameters, root mean squared errors (RMSE) and average mean errors (MRE) for the modified exponential equations that optimize the prediction accuracy of fire danger indices (FDIs) for jarrah (NJs) and karri (Ks), which vary as a function of forest ground wind speed ($WIND_{fg}$) for a given surface litter moisture content (SMC).

	$FDI_{(NJs)} = Yj + Aj\ EXP(WIND_{fg}\ Nj)$					$FDI_{(Ks)} = Yk + Ak\ EXP(WIND_{fg}\ Nk)$				
SMC	Yj	Aj	Nj	RMSE	MRE	Yk	Ak	Nk	RMSE	MRE
3	12.82	36.84	0.41	16.30	12.75	-32.76	44.91	0.53	47.20	34.02
4	2.62	30.54	0.40	20.81	14.84	-8.24	28.86	0.52	24.78	18.85
5	-9.36	28.64	0.37	25.64	16.51	-11.75	22.87	0.52	18.30	13.08
6	11.38	16.44	0.40	9.80	2.63	-5.71	19.08	0.51	11.76	9.06
7	10.20	13.82	0.39	12.78	8.47	-6.70	18.08	0.49	7.99	7.21
8	7.80	11.87	0.38	6.42	4.39	-4.24	16.20	0.48	9.20	6.67
9	5.32	10.92	0.37	4.63	3.60	-0.70	13.66	0.48	8.56	6.37
10	5.60	9.42	0.36	9.23	6.24	-0.66	12.61	0.46	5.25	4.45
11	4.19	8.76	0.36	15.60	5.54	0.05	11.32	0.46	4.26	3.70
12	3.43	8.14	0.35	6.63	4.53	1.04	10.46	0.45	5.44	4.01
13	3.55	7.40	0.34	4.00	2.87	1.01	10.08	0.43	2.72	2.33
14	4.24	6.27	0.35	0.97	0.84	1.70	8.55	0.44	3.52	2.66
15	2.06	6.52	0.34	5.25	3.59	4.74	6.11	0.47	2.71	1.73
16	2.16	5.99	0.33	1.52	1.26	2.80	6.65	0.44	2.84	2.21
17	1.24	5.92	0.32	1.40	1.05	3.00	6.11	0.43	1.23	0.95
18	2.54	5.04	0.32	1.86	1.34	2.00	6.09	0.41	2.65	1.88
19	3.26	3.72	0.34	1.26	1.00	4.51	4.05	0.46	0.59	0.51
20	1.52	4.26	0.31	0.64	0.51	4.04	3.92	0.44	1.57	1.14
21	.	.	.	.	.	4.59	3.23	0.46	1.42	1.04
22	0.09	4.40	0.29	1.32	0.84	4.39	3.02	0.45	0.64	0.53
23	.	.	.	.	.	3.54	3.11	0.43	0.96	0.74
24	-2.59	5.49	0.24	0.85	0.74	3.61	2.87	0.43	0.41	0.32
25	.	.	.	.	.	2.95	2.92	0.42	1.03	0.78
26	-0.86	5.30	0.20	0.45	0.34	.	.	.	.	.
Combined				9.64	4.73				12.70	5.45

DISCUSSION

Sneeuwjagt and Peet's (1985) tables are a significant contribution to fire behaviour forecasting in WA. The methodology of this prediction system is sufficiently modular to incorporate facilities to predict fire behaviour for most of the forest fuel types throughout Australia (Burrows and Sneeuwjagt 1989). Although it would be necessary to establish new empirical relationships for other pine and eucalypt forest types, such an expansion is feasible because the system takes into account the presence or absence of a deep litter bed, trash, scrub and slash fuel components for a given fuel complex. Any further expansion of the current tables, however, will render them even slower and more cumbersome to use.

Seventy-two equations have been developed to perform the majority of the predictive functions that are encompassed within the forest fire behaviour tables for WA. In the present work, the equations for the tables have been organized according to the sequence in which calculations are made to generate a fire danger index and a forward rate of headfire spread for non-standard conditions. Two prediction sub-systems have been developed, which support the prediction of litter moisture contents and available fuel quantities, to help structure calculation procedures that are quite complex. This restructuring has been carried out to clarify and simplify the prediction methodology that was presented in the 1985 edition of the tables. The essence of the prediction process has not been altered, it has simply been reorganized and procedures have been stated explicitly.

Equations alone do not necessarily eliminate the need for a manual, tabular system to support calculating fire behaviour in the field. Nonetheless, the 1985 edition of the tables could be restructured and proper application of the tables could be detailed explicitly. These improvements would simplify the manual, tabular system and clarify its use and limitations, thereby increasing the overall effectiveness of the system.

Each equation is as suitable for generating predictions as the table from which it originated. The equations provide predictions that are no more accurate than the tables from which they were developed. Any assumptions and limitations that are relevant to the use of the tables also apply to the equations. Actual rather than forecasted input values should be used when increases in prediction accuracy merit any additional cost or effort involved.

The application bounds provided for each equation must be observed. Although these limits have met with success operationally for a number of years, predictions within the bounds of the original data should be most accurate. The most reliable predictions are attained within the bounds of the fuel, weather and fire behaviour characteristics that have been experienced during experimental fires (Table 4), and the relationships between fuel, weather and fire behaviour characteristics are probably better understood for northern jarrah than for karri fuel complexes, and least understood for pine fuel complexes in WA.

The equations derived represent a significant advancement by which predictions of fire danger and fire behaviour characteristics can be compared with those of other prediction systems, and predictions can be automated readily using a computer. The prediction sub-systems and the equations provided herein should facilitate the process of incorporating any future developments into the prediction system because they can be modified or replaced easily. The equations have been used in the Wildfire Threat Analysis System (Underwood 1988; Beck and Muller 1989; Muller 1993), and can be applied by way of personal computer software that has been produced by REMS Research Ltd (1991).

It would have been far more sensible to develop equations, and probably more simple ones, from the original experimental data. In some cases these data have been lost, are currently being re-analysed (Burrows, personal communication) or were otherwise unavailable. Despite its operational success, the incompleteness of published data behind the WA fire behaviour prediction system detracts from its scientific credibility. It is hoped that this work will be followed by improved equations based on published data.

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APPENDIX 1
Fuel type abbreviations, expanded forms and descriptions used in the equations for the forest fire behaviour tables for Western Australia (after Sneeuwjagt and Peet 1985).

ABBREVIATION	EXPANDED FORM	DESCRIPTION
NJ	northern jarrah	represents the fuel type common to the jarrah-dominant forests and carry a sparse, low (< 1 m) understorey
SJ	southern jarrah	represents the fuels common to the jarrah-dominant and jarrah-marri association and carry a low (1 m) understorey of scrub structural type 1 (S1)
K36	karri 3/6	represents the fuels found in the jarrah-marri and karri-marri associations, which have an open canopy, and carry a low (up to 2 m) understorey, which is continuous horizontally, of either scrub structural type 3 (S3) or 6 (S6)
K45	karri 4/5	represents the fuels in the karri-marri dominant forest types, which have a medium to dense canopy, and carry a tall (up to 5 m) understorey, which is continuous horizontally, of scrub structural type 4 (S4) or 5 (S5)
K12	karri 1/2	represents the fuels found in the karri dominant forests, which have a medium to dense canopy and are usually situated in wet gullies, with a tall (> 5 m) understorey, which is continuous horizontally, containing either scrub structural type 1 (S1) or 2 (S2)
KR	karri regrowth	represents the fuel complex in 10- to 20-year-old dense karri and marri sapling stands. Where karri regrowth occurs on sites that previously carried pure karri, the scrub is usually either structural type 1 (S1) or 2 (S2), and moisture and fire behaviour characteristics are similar to those of K12 fuel types. Where karri-marri regrowth occurs on sites that previously carried mixed karri-marri, the scrub is usually either structural type 4 (S4) or 5 (S4), and moisture and fire behaviour characteristics are similar to those of K45 fuel types
M	mixed marri, karri and jarrah	represents the litter fuels of mixed forests composed of marri, karri and jarrah
W	wandoo	represents the fuel complex of wandoo stands. Stands that are situated upslope topographically tend to have moisture and fire behaviour characteristics that are similar to those of NJ fuel types. Stands of wandoo that are situated in gullies carry an understorey of scrub structural type 1 (S1), and tend to have moisture and fire behaviour characteristics that are similar to SJ fuel types
OS	open slash	refers to the sheltered fine fuels within slash heaps that are generated by clearfelling and harvesting marketable hardwood or softwood forests
PP	*Pinus pinaster*	represents the fuels of managed *Pinus pinaster* plantations that have been established on sandy soils and have a closed canopy
PR	*Pinus radiata*	represents the fuels of managed *Pinus radiata* plantations that have been established on loamy soils and have a closed canopy
J	jarrah	refers to a general class of fuel types that have fire behaviour characteristics that are derived, in part, from those of northern jarrah. Fuel types that belong to the general jarrah class include: northern jarrah; all pine fuel types; upslope wandoo; and open slash of any of these fuels types
K	karri	refers to a general class of fuel types that have fire behaviour characteristics that are derived, in part, from those of karri 4/5. Fuel types that belong to the general karri class include: southern jarrah; karri 4/5; karri 1/2; karri regrowth; karri 3/6; gully wandoo; and open slash of any of these fuels types
NJs	standard northern jarrah	refers to a northern jarrah (NJ) fuel type that contains 7.6 - 8.5 t ha^{-1} of available fuel, which has accumulated over a five-year period in the absence of fire
Ks	standard karri	refers to a karri (K) fuel type that contains 15.0 - 19.0 t ha^{-1} of available fuel, which has accumulated over a five-year period in the absence of fire
S1	scrub structural type 1	represents the scrub fuels associated with scrub structural type 1, which may contain, for example, hazel (*Trymalium floribundum* Steudel - referred to formerly as *T. spathulatum*), netic (*Bossiaea laidlawiana* Tovey and Morris, although *B. aquifolium* Benth. is common on wetter sites in the northern forests of the south-west), and karri wattle (*Acacia pentadenia* Lindl.), and have an average top height of 5-7 m

APPENDIX 1 (Continued)

ABBREVIATION	EXPANDED FORM	DESCRIPTION
S2	scrub structural type 2	represents the scrub fuels associated with scrub structural type 2, which may contain, for example, hazel or netic, with *Acacia* spp., and have an average top height of 5-7 m
S3	scrub structural type 3	represents the scrub fuels associated with scrub structural type 3, which may contain, for example, hovea (*Hovea elliptica* (Smith) DC.), *A. pulchella* R. Br., *A. browniana* Wendl. and *A. pentadenia*, and have an average top height of 1.5-3.5 m
S4	scrub structural type 4	represents the scrub fuels associated with scrub structural type 4, which may contain, for example, *Agonis* spp., which is most often *Agonis flexuosa* (Sprengel.) Schau., and have an average top height of 3.5-5.5 m
S5	scrub structural type 5	represents the scrub fuels associated with scrub structural type 5, which may contain, for example, netic, *A. urophylla* Benth. ex Lindl. and young hazel, and have an average top height of 3.5-5.5 m
S6	scrub structural type 6	represents the scrub fuels associated with scrub structural type 6, which may contain, for example, young scrub including any of the species mentioned above, creeper (for example, *Kennedia coccinea* Vent., *K. prostrata* R. Br., *Clematis pubescens* Huegel ex Endl. or *Hardenbergia comptoniana* R. Br.), tall rushes, grasses, and sedges (mostly Cyperaceae and one example of genera would be sword grass, *Lepidosperma effusum* Benth.) and young jarrah, and have an average top height of 0.6-1.5 m

APPENDIX 2.
Descriptions of variables that are used in the text and equations.

VARIABLE	DESCRIPTION
AFF	is the available fuel factor for a given fuel type
AFQ	is the available fuel quantity in t ha^{-1} for a given fuel type
AMC	is the temporal and fuel specific moisture content of aerated needles
AMCa/z	is the minimum/maximum moisture content of aerated needles of a given fuel type
Ba	is the available branch weight in t ha^{-1} for a given fuel type
Bav	is the weight of branchwood (t ha^{-1}) for a given fuel type that is normally available for burning
BDU	is the basic drying unit
BHava	is the time in hours that is available to prescribe burn, in a given fuel type, in the autumn
BHavs	is the time in hours that is available to prescribe burn, in a given fuel type, in the spring
Btot	is the total weight (t ha^{-1}) of branchwood for a given fuel type, that is available for burning under extremely dry conditions
CC	is the percentage canopy cover
DDCp	is the day drying correction to today's maximum profile moisture content for a given fuel type
DDCs	is the day drying correction to today's maximum surface moisture content for a given fuel type
DP	is the litter depth in mm
FDI	is the fire danger index for a given standard fuel (m h^{-1})
FQCF	is the fuel quantity correction factor for a given fuel type
If	is the fire intensity factor
L	is the total litter weight (t ha^{-1}) of a given fuel type
La	is the weight of available litter (t ha^{-1}) for a given fuel type
LF	is the number of annual leaf falls that have occurred since the last fire
Na	is the available aerial needle weight in t ha^{-1}
Nf	is the weight of fresh, aerated needles in t ha^{-1}
Ng	is the weight of grey, aerated needles in t ha^{-1}
NWCp	is the night wetting correction to yesterday's minimum profile moisture content, for a given fuel type, that is applied on rainless nights (dry) or in the event of rain (wet)
NWCs	is the night wetting correction to yesterday's minimum surface moisture content, for a given fuel type, that is applied on rainless nights (dry) or in the event of rain (wet)
ORHC	is the overnight relative humidity count
PMC	is the profile moisture content of a given fuel type at a specific time of the day
PMCa/z	is today's minimum/maximum profile moisture content for a given fuel type
RAIN	is the amount of rain in mm, recorded at 0800 hours, for the past 24-hour period
RHa	is today's minimum relative humidity
ROS	is the forward rate of headfire spread (m h^{-1}) over level to undulating terrain
ROS_θ	is the forward rate of spread (m h^{-1}) of a fire on terrain of slope θ degrees
Sa	is the available scrub weight in t ha^{-1}
SCORCHau	is the maximum autumn scorch height (m) for a given fuel type
SCORCHsp	is the maximum spring scorch height (m) for a given fuel type
Sdf	is the scrub density factor
SDI	is Mount's (1972) soil dryness index as modified by Burrows (1987)
SFF	is the scrub flammability factor
Sht	is the average scrub top height (m)
SMC	is the temporal and fuel specific surface litter moisture content
SMCa/z	is today's minimum/maximum surface moisture content for a given fuel type
SR	is the number of stems per hectare removed during thinning
STARTt	the time at which prescribed burning can begin in a given fuel type
SWT	is the live scrub fuel weight (t ha^{-1})
t	is the time for which inputs are relevant (hours)
T	is the current dry bulb temperature (°C)
Tra	is the weight of available trash in t ha^{-1}
Trav	is the weight of trash material (t ha^{-1}) that is less than 10 mm in diameter
Tdepth	is the depth of trash (m)
Tdew	is the dew point temperature (°C)
Tdf	is the trash density factor
Tt	is the dry bulb temperature (°C) at time (t)
Trtot	is the total weight of all trash material (t ha^{-1})
Tw	is the current wet bulb temperature (°C)
Tz	is the today's maximum temperature (°C)
VP	is the vapour pressure (mbar; 1 bar = 100 KPa)
$WIND_{fg}$	is the forest wind speed (km h^{-1}), at a height of approximately 1-2 m above the ground
$WIND_r$	is the wind ratio
$WIND_{rf}$	is the wind ratio factor
$WIND_t$	is the wind speed (km h^{-1}) measured at a fire tower that is situated some height above the forest canopy as given by a selected wind ratio
YPMCa	is yesterday's minimum profile moisture content for a given fuel type
YSMCa	is yesterday's minimum surface moisture content for a given fuel type

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Aboriginal names for some biota from the Great Victoria Desert, Western Australia

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ABSTRACT

This paper reports 107 Aboriginal names and some uses, most previously unrecorded, of plants and animals from the southern Great Victoria Desert obtained from people currently occupying, and with strong cultural ties to the Desert. Some data on distribution and abundance of threatened fauna and a list of birds are provided.

INTRODUCTION

This project arose from a meeting at Yakatunga in November 1988 to discuss CALM involvement with local Aboriginal people in joint management, particularly of access and roading requirements, in the Great Victoria Desert Nature Reserve. As a result, there was a series of five field trips into the Reserve and surrounds in 1989, 1990, 1991 and 1993 which were funded by CALM and the Australian Nature Conservation Agency under the Contract Employment Program For Aboriginals In Cultural Resource Management (CEPANCRM). The purpose of this work was not only to gain ethno-biological data but to spend time with traditional owners of country in which CALM has an interest.

Aboriginal people have occupied the Great Victoria Desert for at least 20 000 years (Cane 1992). The speakers in this study are from the Great Victoria Desert; they were moved with their families from their desert homelands to Cundeelee, 160 km east of Kalgoorlie between the late 1940s and mid 1960s. In spite of this re-location these people still retain very strong cultural ties with Oak Valley, Maralinga and Yalata lands in South Australia. Traditional affiliation is a complex subject and the reader is referred to Cane (1992) for further treatment of this subject.

In the main the speakers relate more to the Pitjantjajara and Yankunytjatjara than to the Ngaanyatjarra dialects. Over the years their language has been 'blended', particularly more recently with increased opportunity for travel between different desert homelands.

The orthography adopted here is based on the unpublished research of Dawn Hadfield *(nee* Martin), on phonetic/phonemic structure of the language spoken by the people at Cundeelee in 1959. This research found the same structure that Wilf Douglas found among the Ngaanyatjarra speakers at the Warburton Ranges. Therefore we conform to that orthography which differs from the Pitjantjajara orthography of that time only in our choice of subscript dot or bar to indicate the very necessary distinction of the retroflex consonants *l, n, t,* and *r*. In this paper our use of *rl, rn, rt* to indicate the retroflex consonants and *rr* to differentiate between the flapped or trilled alveolar fricative and the retroflex alveolar was chosen because it was found to be much more easily recognizable to recent literates.

The climate, geology and more particularly the vegetation of the area covered by this paper are described by Beard (1975). Geologically the Great Victoria Desert occupies most of the Eucla Basin which was formed by the downwarping of the earth's crust in Palaezoic-Mesozoic time and the subsequent deposition of marine sediments in the Eocene-Miocene. The sand dunes which overlay the sediments in the north of the area are a comparatively recent feature being only of Quarternary age (Williams 1984). Climatically the north of the region has a desert (summer and winter rain) regime and the south a desert (non-seasonal) regime; both classifications include the lowest annual average rainfall, approximately 150 mm, in Western Australia (Beard 1975).

The vegetation of the area covered by this paper includes the transition from the treeless plain of the Nullarbor, north through the belt of Mulga (*Acacia aneura*) and Myall *(Acacia papyrocarpa)* woodlands to the rolling sand dunes and *Eucalyptus gongylocarpa* woodlands of the Great Victoria Desert. Interspersed through the two latter sub types are ancient paleo-drainages of Tertiary age with their characteristic vegetation.

METHODS

Twenty Paupiyala Tjarutja members, five CALM staff and one linguist (BH) were involved making a total of 170 person-days contact. Brian Hadfield's participation was enabled by the State Government's 'social advantage' program.

The routes traversed in this work are indicated in Figure 1. The second trip in 1989 traversed a proposed northern access which was later rejected by the community for an access between Yorkie's Tank in South Australia and Tjuntjunjarra. The trip in 1990 occurred with prescribed burning in Neale Junction Nature Reserve. The trip in 1991 surveyed the final route for the Yorkie's Tank to Tjuntjunjarra road. A final trip in 1993 between Ilkulka and the State border established the correct orthography for the words previously collected.

ANNOTATED LIST OF PLANTS

The Aboriginal name in the second column is the one obtained in the course of this work, wherever possible it is referenced to Douglas (1988). Vernacular names in the third column of each entry are from Bennett (1991).

Amphipogon strictus	**kutarnu**	Grey-beard Grass

Soft bunch grass growing with Mulga in inter-dune swale east of Ilkulka on Emu Road.

Acacia aneura	**wintalyka** (fine phyllodes) **wanari** (fine phyllodes) **minyuru** (thick phyllodes)	Mulga

Small tree to 6 m, grows in sandy loams in inter-dune swales. Douglas (1988) indicates **'Minyura'** for 'bushes found along banks of creek' which is consistent as this name was given for Mulga growing along Masons Gully. However, note the different spelling which we attribute to a dialectical difference. Main use: wood for boomerangs, digging sticks, etc.

Acacia burkittii	**murrunpa**	Pin bush Sandhill Wattle

Rounded shrub to 4 m, with terete phyllodes, grows on low sandy rises in the vicinity of Forrest Lakes. Main use: Maku (which are highly valued, ede) obtained from roots.

Acacia dictyophleba	**mintju**	Ngarkalya Sandhill Wattle

Erect shrub to 4 m growing in sand between dunes east of Ilkulka on the Emu road. We were shown how spears, **'kurlarta'**, were obtained from the roots of this plant.

Acacia grasybi	**pirlka pirlka**	Minniritchie

Flat-topped, cone-shaped shrub to 1.5 m with characteristic red stripping bark, grows in sandy soil with rocks east of Ilkulka on Emu Road.

Acacia ligulata	**warrtaka**	Watarka Dune Wattle Umbrella Bush

Spreading shrub to 3 m which is common in the Great Victoria Desert. Main use: 'Maku' can be obtained from the roots.

Acacia linophylla	**pakurta**	Wanyu Bowgada Bush

Shrub to 3 m, flowering in April, with terete phyllodes much longer than those of *A. burkitti*, and widespread in Great Victoria Desert.

Acacia oswaldii	no name recorded	Miljee Nelia Umbrella Wattle

Uncommon, rounded shrub to 2 m growing where calcrete is exposed on the surface. No name was offered for this plant but the wood was used to make hitting sticks.

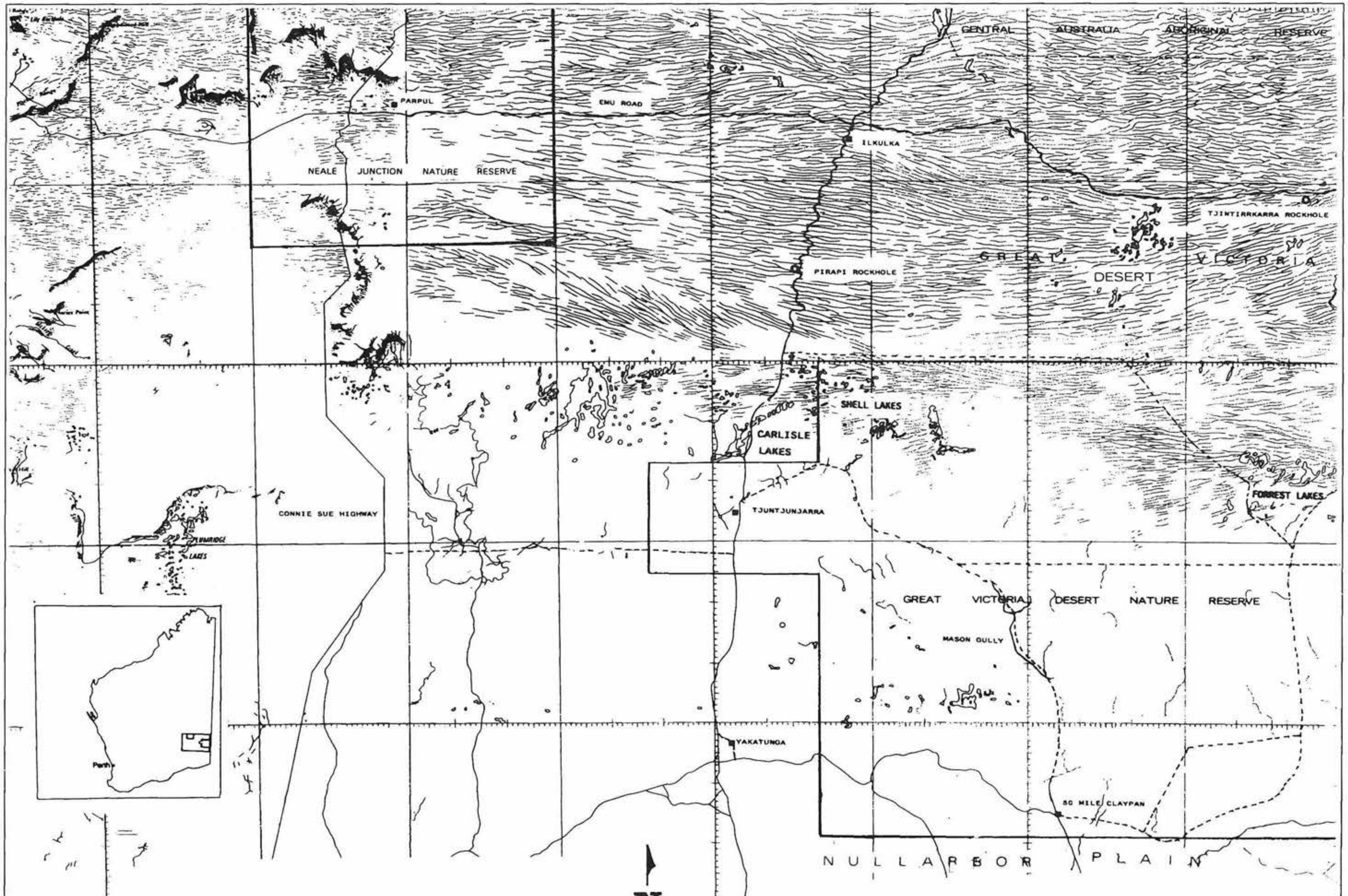

FIGURE 1. SHOWING LOCALITIES MENTIONED IN TEXT
——— MAJOR ACCESS
- - - - MINOR ACCESS OR CROSS COUNTRY TRAVERSE

Acacia tetragonophylla	**wakalpuka** **kurarra**	Kurara

Straggling shrub to 2 m with sharp, terete phyllodes.

Acacia papyrocarpa	**kartaya**	Western Myall

Tree to 8 m with rough bark and characteristic rounded canopy. Main use: wood for boomerangs.

Other *Acacia* terminology:
Ikuwara/Ilkuwara/Ilykuwara. Edible galls occurring on numerous *Acacia* species. Note that **'Ilykuwara'** can also refer to a particular plant; in this case *Acacia kempeana,* (Arpad Kalotas *personal communication*).

Atriplex species	**puntaru**	Saltbush

Low perennial shrubs, uncommon in the Great Victoria Desert except along paleo-drainages and around breakaways but frequent on the Nullarbor Plain.

Bonamia rosea	**manimani**	Felty Bellflower

White flowering herb to 30 cm probably a disturbance opportunist, growing along Anne Beadell highway (Emu road) at 28°20'S, 126°52'E.

Brachychiton gregorii	**ngalta**	Desert Kurrajong Ngalta

Small thick-trunked tree with well developed canopy, occurs sporadically throughout Great Victoria Desert. Main use: shade, water may be obtained from the roots.

Casuarina cristata	**kurrkara**	Belah Black Oak

Tree to 12 m, occurs sporadically throughout the Great Victoria Desert, particularly in inter-dune swales on calcrete and lake edges with alkaline soils.

Convolvulus erubescens	**puurnpa**	Australian Bindweed Pink Bindweed

Creeper-like perennial herb with edible, bean-like seed case growing on low shrubs. Recorded in donga at 128° 26.50'E, 30°06.00'S. Main use: edible seed and pod.

Codonocarpus cotinifolius	**kalurti**	Desert Poplar Native Poplar Bell-fruit Tree Mustard Tree Kanturangu

Tall shrub or small tree which grows rapidly after fire or ground disturbance, particularly along Anne Beadell highway (Emu road).

Dodonaea viscosa	**tjininypa**	Sticky Hopbush

Tall shrub to 3 m grows in granitic breakaway gullies. This name recorded in breakaways called **'Parpul'** near airstrip 23 km east of Neale Junction. The same name was given for *Dodonaea viscosa* ssp. *angustissima* from Forrest Lakes.

Duboisia hopwoodii	**walkalpa**	Pituri Kundugu Kungungu

Spreading shrub to 2.5 m, growing on low sand-dunes. Douglas (1988) also gives **'Kungkungu'**. We were repeatedly told of the importance of this plant for poisoning emus by placing the leaves in water in rockholes. Human use of this plant was never mentioned to us. The vernacular **'kungungu'** refers to the product, i.e. poisoned water rather than the plant itself.

Eragrostis xerophila	**wangurnu**	Knottybutt Grass

Grass growing on the Nullarbor and its northern fringe. Main use: the seeds are ground up to make flour.

Eriachne helmsii	**parlta parlta**	Buck Wandarrie Woolybutt Wandarrie

Grass growing in sand-dunes in the vicinity of Ilkulka. The name is onomatopoeic for the sound made when the grass is burning.

Eremophila gilesii	**murlirli**	Charlieville Turkey Bush

Low shrub, grows in inter-dune swales usually with Mulga, collected at 127°33'E, 28°25'S. Douglas (1988) also gives this name.

Eremophila latrobei	**ngarrankura**	Georgina Poison Bush Warty Fuchsia Bush Mintjingka

Low shrub to 1 m usually grows on rocky substrate. Douglas (1988) also gives **'ngarrankura'** for this plant. People repeatedly told us of its nectar qualities **(tjurratja)**; including a story that in cases where the women were unexpectedly required to assist in hunting, they would place their babies under this shrub to suck on the flowers until they returned.

Eremophila punctata	**walyuwalyu**	

Low shrub to 1.5 m, grows on low dunes, recorded at 127° 34'E, 28° 23'S.

Eremophila serrulata	**tjintatjinta**	Serrate-leaved Eremophila

Shrub to 2 m, grows on sand-dunes.

Eucalyptus concinna	**ngapari** **pulara**	Victoria Desert Mallee Desert Gum

Smooth, white-trunked, multi-stemmed mallee, very common in the Great Victoria Desert.

Eucalyptus glomerosa	**kunyalyka**	Jinjulu

Tall, spreading mallee to 8 m with rough bark on lower trunks. Recorded near Tjintirrkara Rockhole.

Eucalyptus gracilis	**mirntilpa**	Snap and Rattle Yorrel Red Mallee White Mallee

Typically a small mallee to 3 m with smooth bark and white flowers in April, always growing on calcrete ridges. We were also shown another much larger multi-stemmed tree to 10 m growing in incipient drainage lines on the northern Nullarbor which was tentatively identified as *E.gracilis.* Water could be obtained from the root of this latter plant.

Eucalyptus kingsmillii	name not recorded	Kingsmill's Mallee

Rough-barked, straggly mallee with yellow flowers. Relatively uncommon in the eastern Great Victoria Desert, only recorded several kilometres east of Ilkulka.

Eucalyptus pimpiniana	**purnirri**	Pimpin Mallee

The vernacular name is from Brooker and Kleinig (1990). Low spreading mallee to 1.5 m, grows in wide inter-dune swales. Recorded at 127° 55'E, 28° 59'S and at 128° 25'E, 29° 06'S.

Eucalyptus rigidula	**pirarrpa**	Stiff-leaved Mallee

Smooth-barked mallee to 5 m growing on sand sporadically in the Great Victoria Desert.

Eucalyptus socialis	**ngapari** **pulara**	Altarpa Pulara Red Mallee

Tall mallee to 7 m, widespread in the Great Victoria Desert, flowering in May 1991.

Eucalyptus youngiana	**yarltarrpa**	Large-fruited Mallee Oldea Mallee Yarldarlba

Usually a rough-barked, multi-stemmed mallee occurring with spinifex except on sand-dunes, occasionally as a tree to 15 m. This species gave occasion for a complicated discourse about other eucalypt terminology:

'**tjartu**' is a generic term for gum resin.
'**tjintjulu**' refers to smaller eucalypt buds, flowers or fruits or particularly to 'beads' or operculums used for decorations or necklaces. Contrast these with '**tjarturtu**' which is a descriptive term for 'in full fruit or laden with fruit'.
'**tjatukurla**' refers to **yarltarrpa** or other large-fruited eucalypt before, during or after flowering.

Exocarpus aphyllus	**kurlapi**	Leaf-less Ballart

Small tree or shrub to 3-4 m, usually in inter-dune swales. The seeds are eaten by birds.

Grevillea juncifolia	**yultakunpa** **tjuntarruntu**	Honey-suckle Grevillea Ultukunpa

Common, orange-flowering shrub to 4 m, grows in inter-dune swales with spinifex. Main use: the flowers were placed in water to form a sugar solution. The name **'Wama tjurratja'** is evidently a generic name for similar flowering plants from which nectar can be obtained.

Grevillea nematophylla	**ilpara**	

Spreading tree to 10 m with lemon-yellow flowers, grows with Mulga in dongas on the Nullarbor Plain. Unlike Mulga, this tree seems to be regenerating in Nullarbor dongas.

Grevillea pterosperma	**tjuntarruntu**	

White-flowering shrub to 3 m, grows on dunes. Recorded at 127°24'E, 28° 39'S.

Grevillea stenobotrya	**yaranypa**	

Common, erect shrub to 5 m with cream flowers, otherwise superficially similar to *Grevillea juncifolia*. Grows on dunes and in swales.

Gyrostemon ramulosus	**kurumaru**	Corkybark

Shrub to 2 m, grows on low dunes. Main use: water may be obtained from the roots of this plant.

Hakea suberea	**witjinti**	Longleaf Corkwood Corkwood Corkbark Tree

Douglas (1988) also gives **'Witjinti'** for this plant. Tree to 6-7 m, grows sporadically in the Great Victoria Desert. Main use: sugar solution **'wama tjuratja'** obtained from the flowers.

Hakea francisiana	**purnuwara**	Emu Tree

Tall shrub or small tree to 4-5 m, mainly restricted to the south-west of the Great Victoria Desert (see Discussion).

Heterodendrum oleaefolium	**tjarlura**	Mingah Bullock Bush Rosewood

There are numerous other vernacular names for this plant. Small tree to 3-4 m, main use: 'good only for shade'. Also associated with **'inma'** or story or songlines.'**parrkaparrka**' refers to a mistletoe growing on this plant. We were told a similar word '**tjarlu**' which refers to any tree offering copious shade, which is also drought resistant and not easily knocked over.

Lawrencella davenportii	**wirntulyurru**	Rose-pink Everlasting Sticky Everlasting

Herb to 15 cm with pink flowers, grows on dunes.

Maireana sedifolia	**puntaru**	Pearl Blue-bush Iwinpa Mamumarra

Shrub to 1.5 m, grows extensively with Myall (*Acacia papyrocarpa)* on the northern Nullarbor and less commonly with Belah (*Casuarina cristata*) further north. According to our consultants the vernaculars **'iwinypa'** and **'mamumara'** refer to a different plant. Note that the same name was also given for *Atriplex* species.

Muehlenbeckia cunninghamii	**irri-irriya**	Tangled Lignum

Tangled, vine-like shrub, grows in small claypan-like depressions or on the edge of some salt-lakes.

Murchisonia volubilis	**tjungku-tjungku**	

Creeper with edible fleshy root, grows on low shrubs in dunes. Main use: edible root.

Myoporum platycarpum	**pulkarrpa**	False Sandalwood Sugarwood Sugar Tree

Small tree to 6 m or shrub, grows on the Nullarbor and sporadically in the Great Victoria Desert. It has a resin, '**kirtitjarra**,' used for fixing flints to wooden handles.

Nicotiana rosulata ssp. *ingulba*	**tawarl tawarlpa**	Rosetted Tobacco

Herb to 20 cm, white-flowering, grows with Mulga in inter-dune swales. Recorded at 127° 26'E, 28° 33'S. Main use: a stimulant, the root is crushed, mixed with ashes and chewed. **'Mingkurlpa'** is the name of this preparation. Note that the sub-specific name is the anglicized version of this word. Note also that Goddard and Kalotas (1988) attribute **tawarl tawarlpa** to *Solanum ellipticum,* but mention that this latter plant is used as a substitute when *Nicotiana* is not available.

Pittosporum phylliraeoides	**tjilpilpa**	Weeping Pittosporum

Small tree or shrub to 8 m, grows in Nullarbor dongas and sporadically north to Forrest Lakes.

Portulaca oleracea	**wakati**	Purslane Inland Pigweed Munyeroo Wakati

Douglas (1988) also give **'Wakati'** for this plant. Prostrate, succulent plant, recorded in the vicinity of Forrest Lakes. Main use: this plant has numerous small black seeds which can be ground up and used as flour.

Prostanthera baxteri	**warra**	

Shrub to 1.5 m, with white flowers, grows on gravelly plain. Recorded at 127° 37'E, 28° 25'S.

Ptilotus obovatus	**purarrpurarrpa**	Cottonbush SilverBush Silvertails Smokebush White Foxtail

Low herb to 40 cm, common in the Great Victoria Desert except in spinifex/sand-dune country.

Ptilotus species. The name **'lirrulirru'** was given for unidentified, pink flowering plants in this genus. Douglas (1988) indicates this is a generic name for pink-flowering plants.

Salsola kali	**tjilka-tjilka**	Roly-poly Sea Kale Soft Buck-bush

Douglas (1988) also gives **'tjilka-tjilka'** for this plant. Low shrub to 0.5 m grows in disturbed situations, particularly rabbit warrens and mobile dunes. '**Tjilka**' generally refers to prickles or prickly objects.

Santalum acuminatum	**wayarnu**	Quandong Native Peach Wayanu plus others

Small tree to 3 m, grows sporadically throughout Great Victoria Desert. Main use: the edible fruit and kernel of the nut are well known to Aboriginal people.

Santalum spicatum	**munyunpa**	Sandalwood Willarak Wolgol plus others

Small spreading tree to 2.5 m, grows sporadically in the Great Victoria Desert. **Witirrpa** refers to Sandalwood nuts and **nyarlpi** the leaves.

Sarcostemma australe	**ipipi**	Caustic Bush/Vine Milk-Bush Ngamul-ngamul

Thick-stemmed, straggling shrub often growing over other shrubs or small shrubs. The milky sap of this shrub is known to be a skin and eye irritant which may even cause blindness.

Senna artemisioides ssp. *artemisioides*	**pilarnpa**	Silver Cassia Puntee, Parka Blue Bush Cassia

Shrub to 1.5 m with yellow flowers. This name was recorded at Ilkulka Rock-hole.

Senna artemisioides ssp. *filifolia*	**punti**	Desert Cassia Punty Bush

Small shrub to 1 m, usually grows in inter-dune swales.

Senna artemisioides ssp. *sturtii*	**kapilykapilypa**	Dense Cassia Grey Cassia Variable Cassia

Small shrub to 1 m, usually grows in *Casuarina cristata* woodland.

Solanum orbiculatum	**irtunypa**	Wild Tomato

Douglas (1988) gives **'kulpurrpa'** and **'tjantu'** for this plant. Low shrub to 0.5 m, grows in the vicinity of Forrest Lakes. Main use: the fruit of this plant is edible and much sought after.

Swainsona formosa	**marlukurukuru**	Sturt's Desert Pea

Prostrate, spreading herb flowering in September-October, growing in water-gaining sites on the northern Nullarbor - southern Great Victoria Desert. Douglas (1988) also gives **'Marlukurukuru'**. Main use: as a decoration, particularly for behind the ear. A white-flowering variant also grows in this general region.

Thryptomene elliottii	**mirrinytji**	

Shrub to 1.5 m, grows in sand-dunes in the vicinity of Forrest Lakes.

Thryptomene maisonneuvei	**pukara**	Desert Thryptomene Waputi

Douglas (1988) also gives **'pukara'** for this plant. Very low, dense shrub less than 1 m, grows more extensively in northern deserts than in the Great Victoria Desert.

In addition, the name **'wintjinara'** was obtained for an unidentified, edible, truffle-like fungus growing in sand-dunes at Forrest Lakes. The name **'kuparu'** was given as a generic term for spinifex.

ANNOTATED LIST OF FAUNA

REPTILES

Aspidites ramsayii	**kunakapi** **murruntu**	Ramsay's Python Woma

A 1.5 m Woma observed on the Trans-continental Railway in open Myall over Bluebush 1 km east of the western boundary of Kanandah Station represents a minor eastern extension of range for this species.

Ctenophorus cristatus	**talangkarra**	Crested Dragon

Recorded in low dunes with mallee and spinifex approximately 30 km north of Tjuntjunjarra and near Tjintirrkara Rockhole.

Ctenophorus reticulatus	**mutukalya**	Reticulated Dragon

Recorded in heavier soils in Black Oak woodland on calcrete ridge.

Eremiascincus richardsonii	**walalka walalka**	

Recorded at the breakaways 'Parpul' 30 km east of Neale Junction. Douglas (1988) gives **'mitika-mitika'** for this species.

Moloch horridus	**ngiyari**	Mountain Devil

Widespread in sandy country with spinifex in the Great Victoria Desert.

Pogona minor	**ngaparla**	Bearded Dragon

Widespread in the Great Victoria Desert, recorded in Belah woodland and mallee on sand-dunes.

Ryhncoedura ornata	**piilpa**	Beaked Gekko

Recorded in spinifex at Ilkulka.

Varanus giganteus	**ngirntaka**	Perentie

Recorded at the breakaways 'Parpul,' 30 km east of Neale Junction.
[Douglas (1988) also gives the names **'ngiyari'**, **'ngaparla'** and **'ngirntaka'**.]

BIRDS

A list of birds recorded in the Great Victoria Desert Nature Reserve is in Appendix 1.

Aegotheles cristatus	**kurrkurrpa**	Owlet-nightjar

Recorded in sand-dunes north of Tjuntjunjarra and heard calling in woodlands.

Ardea novaehollandiae	**kurtalypa**	Pacific Heron

Recorded perching in Myall tree near Forrest Lakes in 1992.

Ardeotis australis	**kiparra** **parrurnpa**	Bustard

Douglas (1988) gives **'nganurti'** for this bird which is moderately common in the Great Victoria Desert and is sought after for food.

Artamus personatus	**tjarlpu-tjarlpu**	Masked Woodswallow

Nomadic, flocking bird in the Great Victoria Desert.

Cacatua leadbeateri	**kakalyalya**	Major Mitchell's Cockatoo

Douglas (1988) gives **'Kakalyalya'** or **'Kakalangu'** for white cockatoos including this species and the Sulphur-crested Cockatoo. We recorded a solitary bird in Mulga in inter-dune swale at 128° 01.607'E, 29° 20.739'S and a pair in *Eucalyptus gongylocarpa* woodland on the Emu road. We were informed that these birds breed in these trees in the Great Victoria Desert.

Circus assimilis	**wilypinypa**	Spotted Harrier

Recorded flying over Myall woodland, open dunes and at Ilkulka and Neale Junction.

Cinclosoma alisteri	**tjintjililinypa**	Nullarbor Quail-thrush

Infrequently recorded bird in denser stands of Bluebush on the Nullarbor Plain. The name **'miilyka'** was given for another Quail-thrush (either Chestnut or Chestnut-breasted) seen in sand-dunes east of Ilkulka.

Cracticus nigrogularis	**wartu-wartu**	Pied Butcherbird

Common bird in open woodlands in the Great Victoria Desert.

Eurostopodus argus	**kuunkutakuta**	Spotted Nightjar

Recorded in sand-dunes north of Tjuntjunjarra.

Falco berigora	**kirr-kirrpa**	Brown Falcon

Recorded occasionally in most habitats in the Great Victoria Desert. Nesting in August 1989.

Falco cenchroides	**warra-warra**	Kestrel

Occasionally recorded in the Great Victoria Desert and on the northern Nullarbor.

Falco hypoleucos	**ilurrpa**	Grey Falcon

A flock of five were recorded in dead Myall over Bluebush on the northern Nullarbor in May 1993.

Falco peregrinus	**warumarlkuntarri**	Peregrine Falcon

Recorded harassing Pied Butcher Birds near Shell Lakes.

Leipoa ocellata		Mallee Fowl

Douglas (1988) gives **'Ngarnamarra'** for this bird which was not sighted by us. A disused nest was located in mallee/ spinifex near benchmark RW9 on the northern boundary of the reserve. A very old nest was located in degraded northern Nullarbor Bluebush country at 130° 10.40'E, 30° 03.60'S. We were informed that Mallee Fowl are still present near Ilkulka.

Manorina flavigula	**piirlpirlpa**	Yellow-throated Miner

Common bird in small flocks in most habitats in the Great Victoria Desert.

Meliphaga plumula	**wirtulululunypa**	Yellow-fronted Honeyeater

Recorded in Mulga at Ilkulka.

Melopsittacus undulatus	**kilykilykarri**	Budgerigar

Douglas (1988) gives **'Kilykilykarri'** for this species. Recorded in small flocks in the vicinity of Forrest Lakes.

Microeca leucophaea	**wiitjulykutjulyku**	Jacky Winter

Infrequently recorded bird in Mulga and Myall woodlands.

Northiella haemogaster	**tjurlily-tjurlilypa**	Naretha Blue Bonnet

This parrot was recorded in pairs and groups of four in many localities in the Great Victoria Desert; it was usually in Myall and Mulga woodlands. The same name was consistently given for Mulga Parrot.

Oreoica gutturalis	**parnparnpalala**	Crested Bellbird

Common bird in the Great Victoria Desert, heard in all habitat types.

Peltohyas australis	**kupilkupilpa** **walatjuritjuri**	Australian Dotterel

Common, in flocks to 50 birds on open plain on the northern Nullarbor.

Platycercus zonarius	**purlalypurlalypa**	Ring-necked Parrot

This woodland inhabiting parrot is only infrequently recorded in the Great Victoria Desert.

Pomatostomas superciliosus	**tjuunytjuunypa**	White-browed Babbler

Recorded occasionally in Myall woodlands and mallee vegetation usually with a shrub understorey. **'Tjuntjunjarra'** apparently takes its name from the presence of this bird.

Rhipidura leucophrys	**tjintirrtjintirrpa**	Willie Wagtail

Common bird in the Great Victoria Desert.

Vanellus tricolor	**ikarkkarrka**	Banded Lapwing

Recorded at Lake Carlisle and at Tjuntjuntjarra.

MAMMALS

Macropus fuliginosus	**kurlpirrpa**	Western Grey Kangaroo

Moderately common in spinifex/sand-dune country in the Great Victoria Desert, occurring as far north as Neale Junction and Ilkulka; also on the Nullarbor Plain. This kangaroo is hunted for meat but the Marlu is by far preferred.

Macropus rufus	**marlu**	Red Kangaroo

Common on the Nullarbor Plain and in more open parts of the Great Victoria Desert including chenopod lake frontage. Douglas (1988) also gives both these kangaroo names.

Notomys alexis	**tarrkawara**	Spinifex Hopping Mouse

Douglas (1988) also gives this name. Tracks and 'pop holes' of this relatively common small rodent were located on a sand-dune at 127° 55'E, 28° 59'S.

Notoryctes typhlops	**itjarri-itjarri**	Marsupial Mole

We were informed that this infrequently encountered marsupial used to occur in the vicinity of Pirapi Rockhole but that it is now 'finished up' here, i.e. extinct.

Oryctolagus cuniculus	**nani** **mitjurnu** **pintjatarn**	Rabbit

Douglas (1988) also gives **'nani'** for the rabbit. We were shown a covered burrow with four kittens in it in August 1989 in *Casuarina cristata* woodland near the northern boundary of the reserve.

The following generic names were given: '**minga**' for ants, '**mingkiri**'for small mammals, and '**pikarru**'for goannas.

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Ian Baird, community adviser of Paupiyala Tjarutja Aboriginal Corporation, and Ray Cranfield, Western Australian Herbarium, provided liaison and identified plants respectively. Geoff Young accompanied AC on the route-surveying trip in 1991. Geographic co-ordinates given with a decimal point were established by Global Positioning Satellite receiver; others are only estimated positions. Dr Eleanor Bennett, Dr Ian Abbott, David Pearson and Arpad Kalotas all commented on and substantially improved an early draft.

DISCUSSION

Sixty-five plant and 42 animal names were recorded in the course of this work. Of these, 32 plant and 16 animal names have been previously recorded by either Douglas (1988), Bennett (1991) or more particularly Goddard (1992). Forty words are in common with the latter work. Where there are minor differences in orthography, in particular more frequent use of retroflex sounds in Goddard (1992), we attribute this primarily to linguistic interpretation and secondarily to dialectical differences. In spite of this the value of this work lies in the fact that it establishes that these words are still in use in the Great Victoria Desert at this time and by these people. Of the names not previously recorded, some are based on a single occurrence; this applies to those plants and animals sighted infrequently. On the other hand many are based on species frequently encountered; in these cases consistency of the name provided was a characteristic of this work.

In some cases a name used generically as a group or descriptive name may have been ascribed by us to a particular plant or animal.

This is probably the case for the name we obtained for *Hakea francisiana*; literally **'purnuwara'** means tall shrub, (Arpad Kalotas *personal communication*) which is an appropriate description of this plant.

It is clear that there are complications with names of mallee eucalypts; for example, the names **'ngapari'** and **'pulara'** were both consistently applied to both *Eucalyptus socialis* and *Eucalyptus concinna*. Goddard and Kalotas (1988) also indicate that in Yankunytjatjara the same name can apply to similar eucalypts; for example, **'itara'** for both *Eucalyptus camuldulensis and Eucalyptus terminalis*. Furthermore, **'ngapari'** can apply to both a tree and the sticky, white secretion which is found on the leaves of eucalypts generally. Similarly, **'tjinjulu'** has been recorded as the name for both *Eucalyptus glomerosa* (Bennett 1991) and *Eucalyptus socialis* (Goddard and Kalotas 1988) but in this work the word refers more particularly to the use of certain eucalypt parts.

Some of the plants and animals encountered in the course of this work are of particular interest owing to either their rarity or limited knowledge of their distributions. This applies to Naretha Blue-bonnet which we now know to be moderately common in Nullarbor-fringing Myall woodlands between Double-Pump bore on Gunnadorah Station and Forrest Lakes. *Eucalyptus pimpiniana* was not previously known from Great Victoria Desert Nature Reserve, nor were the gazetted rare fauna Scarlet-breasted Parrot and Major Mitchell's Cockatoo. Ramsay's Python from the Nullarbor Plain is a minor extension of range and the Grey Falcon is a very infrequently recorded species.

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APPENDIX 1

List of birds recorded from the Great Victoria Desert Nature Reserve. These data are compiled from the 'Jubilee' and 'Forrest' sites of the Nullarbor biological survey (see Burbidge *et al.* 1987) as well as birds recorded in the course of this work.

Emu
Pacific Heron
Grey Teal
Black-breasted Kite
Little Eagle
Wedge-tailed Eagle
Spotted Harrier
Peregrine Falcon
Brown Falcon
Australian Kestrel
Little Button Quail
Australian Bustard
Banded Plover
Australian Dotterel
Ring-necked Parrot
Blue-Bonnet
Mulga Parrot
Scarlet-breasted Parrot
Budgerygah
Major Mitchell
Pallid Cuckoo
Horsefield's Bronze Cuckoo
Tawny Frogmouth
Australian Owlet-Nightjar
Red-backed Kingfisher
Rainbow Bee-eater
White-backed Woodswallow
Richard's Pipit
Black-faced Cuckoo-Shrike
White-winged Triller
Jacky Winter
Red-capped Robin
Hooded Robin
Rufous Whistler
Grey Shrike-Thrush
Crested Bellbird
Willie Wagtail
White-browed Babbler
Southern Whiteface
Weebill
Broad-tailed Thornbill
Chestnut-rumped Thornbill
Yellow-rumped Thornbill
Variegated Fairy-Wren
White-winged Fairy Wren
Brown Songlark
Australian Sitella
White-browed Tree Creeper
Rufous Tree Creeper
Striated Pardalote
Singing Honeyeater
Yellow-fronted Honeyeater
White-fronted Honeyeater
Yellow-throated Miner
Spiny-cheeked Honeyeater
Crimson Chat
Zebra Finch
Magpie Lark
Masked Woodswallow
Black-faced Woodswallow
Grey Butcherbird
Pied Butcherbird
Australian Magpie
Grey Currawong
Little Crow

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